

**Hyperinflation and the reconstruction of a national money:
Argentina and Brazil, 1990-2002**

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ABSTRACT

Under high inflation, money experiences a process of institutional fragmentation : the unit of account and the unit of payment are split and transferred on alternate supports, either a foreign currency as for instance in Argentina, or domestic indices as in Brazil. Since the early 1970s', this alternate options have had far-ranging consequences on stabilisation strategies, on how monetary functions have then been re-integrated as on the overall quality of monetary regulation, i.a. for macroeconomic management. This paper compares the 1994 Brazilian Real Plan, which rebuilt a working, national monetary order, and the bimonetary Argentine Currency Board regime. After the 1999 devaluation in Brazil had demonstrated the resilience of the new money, un-pegging the Argentine peso caused a major dislocation in 2002. 'Pesification' is then analysed as an improvised attempt at rebuilding a single, national money. Surprising positive results were observed as regard the price mechanism for labour and goods. Conversely, 'pesification' of financial contracts (deposits, credits, bonds, etc.) proved a disaster : State intervention into private contracts, which was justified by the presence of a valuable public good – money –, opened the way for a large-scale, opaque redistribution of private wealth. This in turn raises the risks of a dangerous weakening of the interaction rules between private and public spheres.

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1- Introduction

Since the aftermath of the First World War, hyperinflation has been a recurring issue of interest for economists and economic historians¹. Most efforts, at least from an analytical point of view, have come from policy-oriented researchers: what are the immediate causes of hyperinflation, its short-term dynamics, the possible stabilisation strategies? Yet, the broader theoretical issues at stake have tended to remain addressed only in part, as these experiences have often been considered as obviously fascinating, though at the same time idiosyncratic, exotic and hence of limited relevance as regard the more general understanding of economic phenomena. In a nutshell: either a professional terrain for IMF officials or a pet-subject for *afficionados*.

A more incisive approach would rather consider hyperinflation as an exceptional “theoretical event”: one which offers a brief though deep insight into the conditions under which a monetary order functions, or can be destroyed, or be rebuilt either around a single national money (a peso) or – wholly or partially - around a foreign unit (say the dollar). In this case, however, money has to be considered as an institution, that is a product of historical and political economic forces, both national and international. Hence the main theoretical obstacle: as long as one works under the deep shadow of general equilibrium theory, money is just the $n-1^{\text{th}}$ good which theoretically allows for decentralised agents to shift from barter to integrated markets. The overall representation of a market economy *de facto* converges towards a non-monetary order that closely resembles that of a centralised economy: the payment system is not made explicit and prices are merely a set terms of trade, expressed in real terms, which are fixed by an *ad hoc* agent – the auctioneer. Arguably not the best starting point for investigating monetary systemic crisis.

Even the alternate quantitative approach to money, though better equipped to account for the short-term analytics of hyperinflation, does not have much leverage beyond immediate nominal evolutions. The long term, structural consequences of high inflation are typically interpreted as an extended loss of credibility by monetary authorities which would call for a strong rule-based regime, implemented by an independent, inflation-focussed Central bank. This would then progressively allow for a fall in expected inflation, real interest rates and possibly dollarisation. Here, money does indeed receive some institutional existence, though it is reduced to that highly volatile essence: the perception of inter-temporal commitments taken by (presumably) elected politicians and in the painful accumulation of ‘credibility’.

This article addresses through the prism of hyperinflation one specific question: how is a working, consistent national money re-constructed, in a more or less coherent manner, after it has been dis-integrated by a prolonged period of high inflation? This however sheds some light on a further set of questions: What are the consequences of a fractured national money, on internal economic regulation as on the interaction with the international monetary system and world markets? Is recoordination around a monetary unit solely a matter of progressive evolution, as reflected by notions of credibility and commitment? Or is there room for more discrete moves, which would cause bifurcations in the long-term evolution of national monetary institutions?

¹ The usual reference for the 1920s’ is Bresciani-Turoni (1937), but one may also consult Fischer (1922), Hayek (1923), Keynes (1923) or Cassel (1932).

Money is considered here under its two main analytical functions: the unit of account, in which real term economic values are measured (such as real wages or real term savings); then the unit of payment which is the monetary instrument into which contractual liabilities are actually settled; it is articulated to the system of payment, which allows decentralised markets to work. In principle, both account and payment units should be closely anchored one on the other: monetary dis-integration under inflation is defined as the process whereby agents tend to split these functions and to transfer them onto alternate units - and vice-versa.

A decisive pattern of monetary institutions is their strong path-dependant character, often observed over the very long term. This first reflects the bearing of extended network externalities. Money is typically a medium which relevance for individuals increases with the number of agents who use it²: collective reliance upon the same unit may thus endow it with substantial resilience against outside shocks. The stability of users' networks is then reinforced by the development and mutual coherence of public institutions – such as a Central Bank or a payment system – as well as of private institutions, first of all financial ones. For the sake of clarity we call a monetary order, the complex set of the monetary functions, public and private institutions, as of the formal and informal rules of usage, which articulate money to the broader economic and financial environment as to policy makers.

Monetary crisis – such as hyperinflation and liquidity crisis – may lead to a sudden destabilisation of monetary order : it may loose its capacity to co-ordinate agents and, as a consequence, its public good quality. If people reject a money, relying upon it individually may become costly and dangerous, while the possibility to conduct monetary policy through this institution will rapidly decline; the standard literature on hyperinflations actually defines these events as situations where money supply, i.e. monetary policy, becomes endogenous to agents' expectations and is not controlled anymore by the Central Bank. The conditions may then emerge for more or less controlled institutional innovations, or as well panicky improvisations, which in turn may affect over the long term how money works: the quality of the private services it offers to agents, its capacity to regulate market exchanges and to allow for some macroeconomic management.

Two remarkable national experiences are analysed over the long terme: Argentina and Brazil. Their interest derive from the length of the respective inflationary experiences (at least two decades), the extent to which economic institutions allowed to accommodate nominal instability, the originality of the eventual stabilisation strategies. The core argument of the article is indeed that, over more than two decades, these countries adopted opposite institutional strategies to limit, or control the impact of high inflation on their economies; these respective choices then bore heavily on the way inflation was ended and a monetary order reconstructed, in the early 1990s', respectively on a bimonetary basis in Argentina and a more inwards-looking one in Brazil. It is argued that this in turn affected the capacity to respond to a severe foreign payment crisis respectively in 2001-2002 and 1999. The analysis of short-term, violent monetary crisis may thus highlights how emerging bifurcations and innovations interact with existing institutions and social practices; and in turn they may then shape the future evolution of monetary orders and how they are articulated to the international monetary system.

Section 2 briefly explains how the protection against the redistributive impact of high inflation may disintegrate national money. Section 3 compares the opposite strategies adopted in this respect in Argentina and Brazil. The next section analyses the theoretical premises beyond the adoption of the Currency Board in the former country, after the failure of the heterodox strategies of the late 1980s'. Part 5 then compares the parallel experiment in Brazil - the 1994 Plano Real – and explains why it delivered wholly opposite results in terms of monetary rules

² See Katz and Shapiro (1994) as well as, for payments issues, Nakamura and Parigi (1992) Angelini (1998).

and capacity to conduct an independent monetary policy. Before concluding, the Argentine 2002 disaster is analysed in the long-term perspective of monetary reforms, in both countries.

2- The protection against high inflation

In order to account for high inflation phenomena, any monetary theory, whether quantitativist or institutionalist, should start from the individual and collective mechanisms whereby agents defend themselves against the inflationary redistribution of revenue and wealth. Typically, as these risks increase and become permanent, contracts whether formal or informal tend to include *ad hoc* revaluation clauses, which automatically adjust payments due to nominal depreciation. This is rapidly the case for wages, deposit and debt contracts, but the same technique may as well be included into all commercial and financial transactions: public and private bonds, tax liabilities, insurance policies, rents, contracts on patents and copyrights, etc.. All would thus be anchored on a 'real' unit of account (for instance the dollar), different from the official, legal money (the peso). And when payments have to be made, 'real term money' will be converted into the current inflationary unit of payment, at the day's revaluation (foreign exchange) rate.

This process has a key institutional consequence: nominal prices, which determine actual payments due, become differentiated from real prices which reflect the initial adjustment of market forces, i.e. the terms of trade (whatever the actual quality of market adjustments). The unit of account thus becomes separated from the unit of payment, as money disintegrates under the pressure exerted by inflation on agent's behaviour. While both functions should be strongly articulated within single national money, they tend to be split and transferred separately onto alternate supports.

Such was the evolution observed in Argentina and Brazil, since respectively the early 1970s' and early 1960s'. The interesting point, around which the argument of this article revolves, is that already at this early hour these countries adopted opposite answers to inflationary taxation, which have had extensive institutional and policy consequences. While Argentina chose the dollar as a dominant monetary substitute (as in the example above), Brazil opted primarily for domestic price indices, that is a domestic monetary substitute, reflecting an inward-looking institutional strategy³. As the population re-coordinated around these alternate monetary units, institutions have also validated and encouraged these choices which thus acquired as strong path-dependent character.

<<< GRAPH 1.a & b >>>>

3. Dollarisation vs. domestic indexation

In Argentina, the early adoption of the dollar as the dominant instrument to hedge inflation risks affected both monetary functions: people would use pesos for daily payments, while counting, saving and investing in dollars under the form of foreign currency deposits in local banks, cash hoarding or extensive capital flight. This process occurred in a context marked by the bad overall quality of macroeconomic management and a rapid weakening of the financial system, especially after the radical liberalisation reforms of the late 1970s. This was reflected in a regime of highly unstable inflation and extensive reliance upon seignorage, with three major

³ Both mechanisms were certainly observed in each country, the issue is that of the main or dominant form of monetary substitution adopted. Many OECD countries adopted more or less systematic forms of wage-indexation till the 1980s', though at much lower average rates of inflation than in Brazil; Chile is the other Latin American economy which has adopted price indexation as the main anti-inflationary technique.

crisis episodes between 1973 and 1985: each saw a steep fall in the exchange rate, a violent acceleration in prices, a large one-off increase in the overall level of dollarisation of the economy and a massive redistribution of private wealth at the main expense of domestic savers. (Sturzenegger 1991, Balinõ 1991).

<<< TABLE 1 >>>

In Brazil, by contrast, monetary dis-integration did take place, but the acceleration in inflation has been more progressive, with lower budget deficits, a smaller reliance upon seigniorage, less monetary shocks along the road and much larger overall real growth (Fishlow 1974, Lara Resende 1990, Simonsen 1995)⁴. Despite accelerating rates of inflation, the monopoly of the national money upon domestic payments was much better preserved: foreign currency deposits in the banking system were never allowed to develop on a large scale and cash transactions in dollars never took hold as they did in Argentina (as indeed in many other developing countries). Till these days, capital controls have also remained much tighter than in most Latin American countries, whatever the pressure of domestic and foreign interest groups. This indeed reflects a degree of consensus, observed during and after the military regime (1964-1984), around a rather controlled, inwards-looking economic model.

<<< Graph 2 >>>

The alternative between dollarisation of the Argentine type and the Brazilian methods of domestic indexation has other important institutional and supply-side dimensions. To start with, anchoring prices and a share of payments on the dollar does not require a very sophisticated financial system: as witnessed in Eastern Europe before the reforms, the most basic form of market exchanges can do, with little or no policy-guidance. Moreover, sharp devaluations and large waves of capital outflows have often had a destructive impact on local banks - contrary to those in Miami. On the other hand, domestic indexation is much more demanding for both public and private institutions. It requires a large degree of *de facto* coordination between social and political actors. Rather than an individual rush towards the dollar, it relies a collective agreement by the population to co-ordinate around a domestic institutions as substitutes support for monetary functions. This in turn requires a degree of confidence in those institutions as in those who govern them and guarantee their preservation, as a public good.

Statistical price indices, to start with, have to be timely, resilient and widely trusted: they indeed become a decisive public good as agents critically rely upon them in order to protect their level of revenue and wealth. Beyond, there is a need for a competitive supply of a diversified set of financial services and inflation-proof assets which actually rely upon these indices: they should be denominated in the national unit of payment and should offer a secure real term remuneration as well as efficient liquidity services. As monetary and banking regulations take hold and shape institutional development, and as private capital is invested, path-dependency takes a stronger dimension.

⁴ This practice was widespread in OECD countries in the 1970s' and early 1980s', although at much lower rate of inflation; Chile is the main alternate experience of this type in Latin America, although it never approached the Brazilian level of inflation.

One example is the interbank payment system, which in Brazil has been remarkably efficient and cost-effective since the 1980s⁵. If settlements are long or unpredictable, or if they can be suspended due to liquidity or counterparty problems, high inflation may rapidly destroy the enterprises' working capital: since by definition these funds are largely invested in the interbank float, which is denominated in base money, they are directly exposed to inflation. At times of monetary crisis, brake-downs in the payment system are indeed a recurrent cause of enterprise decapitalisation and supply side shocks on real activity. Another case is the inception of Brazilian indexed Treasury bills, in 1987, which created the basis for a strong growth in the supply of tradable, protected financial assets. These new securities were then issued as well by private firms and bought on a large scale by institutional investors and households. Despite accelerating rates of inflation, the following years witnessed a rapid real-term growth of private balance sheets, technical know-how and high-tech investment in Brazilian banks; at that time, the Argentine banks were being almost destroyed by hyperinflation.

4. Heterodox stabilisation policies and the Currency Board in Argentina, 1985-1991

Dollarisation and indexation are rational short-term responses to inflation, both at the individual and collective levels. But they are not sustainable over the long term: they have large adverse consequences on the economy and do not allow postponing stabilisation indefinitely.

The main issue is the following. Discounting pure short-term volatility, a one-off correction in the relative prices of a given domestic sector (say agriculture), or a shock on the exchange rate, should cause in principle a permanent adjustment of the overall structure of relative prices. Agricultural (resp. internationally traded goods) will become (for instance) more expensive and the relative profitability of the sector will increase ; in principle, again, production factors (labour and capital) will thus be progressively re-allocated to more profitable sectors, so that the supply side of the economy will adjust to market signals and recovers some growth potential. Yet, if dollarisation or indexation is pervasive, relative price movement will tend to be followed by a general increase in *all* prices, as agents will try to protect their purchasing power. Even haircuts, plumbing repair and laundry services will be priced in dollars as the respective producers will perceive as an increase in overall inflation what was initially a correction in relative prices. In other words, social resistance to inflationary redistribution of revenue *causes* an overall increase in the rigidity of the going, inter-sectoral distribution of revenue vis-à-vis price signals⁶. Macroeconomic management as well then becomes more difficult: a depreciation will produce more inflation and less real adjustment, as the relative profitability of sectors is not modified. Monetary policy loses its grip on the real economy

The second main problem – observed especially in the case of domestic indexation - is that the economy is increasingly governed by a backward-looking price mechanism: the inflation rate tends to be reproduced identically, from one period to the next, adding all additional shocks. This is the definition of 'inertial inflation', which shows a strong downwards rigidity and a pattern of stepwise acceleration⁷ - hence its non-sustainability over the long term. It makes stabilisation more difficult as the agents, and the overall economy, increasingly accommodate a high-inflation regime.

⁵ See Listfield and Montes-Negret (1996); in Argentina, conversely, till the end of the 1990s', settlements between commercial banks and the Central Bank were still done, to a large extent, in cash i.e. via armoured trucks.

⁶ This does not imply that overall social inequalities tend to be frozen: for instance, the poorer, who do not have access to the banking system, and who entirely in cash, cannot protect easily against inflation.

⁷ Already in the 1970s', as monetary policy in Brazil explicitly targeted real interest rate, it showed a clear trend towards a *de facto* loss of control over inflation (Garcia, 1996).

The intellectual and policy history of stabilisation programmes since the late 1970s' has been largely dominated by this problem and by the responses, which have been proposed to it. Under inertial inflation, standard, orthodox strategies, which rest only on budgetary and monetary control variables, have tended to deliver slow or partial results, generally at a high cost in terms of output and job losses. Such has indeed been the case of an early series of purely monetarist plans, in Latin America in the late 1970s and early 1980s' - for instance with the Martinez de Hoz programme, in Argentina (Calvo 1986). Failures have then led to the emergence of a second 'heterodox' generation of programmes, which were explicitly founded on the 'inertial', institutional analysis of inflation and have dominated, at least intellectually, the latter half of the 1980s'. On top of a "shock-therapy approach", plus standard macroeconomic measures and a temporarily fixed exchange rate, they typically relied upon a comprehensive freeze of prices and wages, as well as on dis-indexation measures, either legal or incentive-based (Dornbusch and Simonsen, 1987, Heymann 1987). Dis-inflation was thus not obtained via a single nominal anchor - money supply or the exchange rate - which, once under strong control, would force a slowing down in all expected and observed price increases. Reliance upon multiple anchors and comprehensive public intervention into private contracts were the defining elements of these programmes - hence the heterodoxy. While this new brand of stabilisation strategies succeeded in Israël (1985) and Mexico (1987), they failed quite rapidly in both Argentina (1985) and Brazil (1986). They were then followed by a series of less consistent approaches, implemented by increasingly discredited governments⁸. The most spectacular outcome was the Argentine hyperinflation of 1989-1990, amongst the most violent in history.

In both countries, durable stabilisation was to be the result of a third generation of programmes: the Argentine *Convertibility Law* of April 1991, which established a Currency Board regime, and the 1994 *Plano Real* in Brazil. Their originality brings back to the institutional dimension of money. Contrary to both orthodox and heterodox approaches, which aimed primarily at a destruction or a substantial weakening of the 'parasitic' link between the national money and its substitute unit of account, these new programmes were formally much *less* ambitious: they opted for *a complete anchoring of the economy on its alternate unit of account*, on which the unit of payment function was then legally transferred. This was exactly the reverse operation to that attempted before: instead of starting from the old unit of payment, they built on the alternate unit of account.

Hence the logic beyond the *Currency Board*: the national money should be definitely anchored at par on the dollar so that both monies would become perfect substitutes, all the peso's functions being carried as well by the dollar, including the legal tender. The rationale was to implicitly admit that the dollar had achieved an almost complete monopoly over the unit of account function and that the last chance for the peso to survive, as a (part-time) unit of payment, was to anchor it as solidly as possible on the dollar. At least some seignorage revenue would be kept, together with the un-avowed capacity to return to a single national money. In order for this commitment to be as strong as possible, the Argentine Central Bank was subjected to well-known, extremely tight rules of emission: reserve money was to be fully backed by dollar-assets, in stock as in flow terms⁹. Capital outflows thus implied a contraction of money supply and credit distribution, via a negative multiplier, without any possibility of sterilisation (Cavallo and Cottani 1997, Canavese 1992). As a consequence, the level of interest rates was the result of the U.S. Federal Reserve's policy, plus the country risk premium as measured by international capital markets - without any room for a locally-determined monetary policy.

⁸ On the orthodox vs. heterodox debate, as on the main related policy experiences, see Bruno (1986), Bruno at alii (1988), Giorgio (1989), Kiguel and Liviathan (1991), Modiano (1990).

⁹ 20/30% of foreign reserves in the Central Bank could actually take the form of dollar-denominated, Treasury Bills issued by the Argentine government.

This regime had two further consequences as regard the way the real economy operated and entered international markets. First, the impossibility of a discretionary creation of money by the Central Bank implied that there was no lender of last resort, so that banks were directly exposed to self-fulfilling liquidity crisis¹⁰. This was a major cause of fragility which indeed justified the sale of most domestic private banks to large foreign groups: the lender of last resort function was to be privatised and internalised within these international banking networks, which would directly support their Argentine branch in case of a depositors' run. The 2001-2002 crisis later showed the tight limits within which such expectations may have been valid. Second, since the exchange rate could not be moved anymore, relative price adjustments as a response to shock on price-competitiveness (wage costs, market contagion, international prices, etc.), were directly transferred to households and enterprises – most notably via downward pressures on prices, wages and employment. The exchange rate could not absorb exogenous shock, even partially: only individual prices could do.

5. The Brazilian experience

The last period of high inflation in Brazil started after the failure of the 1990 orthodox *Plano Collor* (Bresser-Pereira and Nakano 1991, Modiano 1991) and was ended in June 1994 by the *Plano Real*, at a time when inflation was almost reaching the symbolic 50% monthly threshold. The technical success of the *Plano Real* just as of the *Convertibility Law* did not rely upon any policy surprise or any shock on expectations: both programme were widely discussed and voted by the Parliament weeks before their inception, so that agents virtually had the complete knowledge of the “true model” of stabilisation, before it was implemented; coordination was thus not the *ex post* result of individual market-based reactions to the plan, when introduced, but rather an *ex ante* component, which relied upon open, public deliberation.¹¹

The *Plano Real* was based on theoretical premises closely comparable to those embedded in the *Currency Board*, as regard the re-integration of monetary functions. The aim was no more to dis-index the old unit of payment but to impose a *complete and voluntary* indexation of the whole price structure on the alternate unit of account. Yet, in accordance with the country' historic experience, in Brazil this did not imply embracing the dollar but a domestic price index. At this decisive turn, the inward looking pattern of monetary institutions thus remained at the core of the strategy to build a new, non-inflationary monetary order.

The *Plano Real* added a further element, directly inherited from the heterodox tradition: it assumed that rebuilding an integrated national money, which is a most-valuable public good, may justify State intervention into private contracts. The key issue was how to do it and which contractual clause would be modified by law. In this respect, past experiences told that a recurring cause of failures was the destabilising reaction of decentralised agents to the programmes, when they were announced and launched, especially when they perceived a large potential redistributive impact. This led on the one hand to abandon the “psychologic shock” approach, while, on the other one, giving priority to a careful treatment of the unit of account. Since it measures and indeed establishes the real term value of assets and liabilities, any reform or manipulation has to be messages and expectations are in line. Conversely, while it can certainly be instrumental in redistributing wealth (as in the case of inflation), the unit of payment is less vulnerable : provided the real value of a contracts is preserved, it is a secondary issue whether payment are settled in cruzeiro, dollar or real, or whether three or six zeroes are shed from the working unit. In other words, State infringement into private contracts is certainly a critical initiative, but underlying redistributive risks are even more dangerous.

¹⁰ See Caprio and all (1996) on how a full collapse of the banking sector was averted *in extremis*, at the time of the 1995 Tequilla crisis.

¹¹ Arida et Lara-Resende (1985) have been the first to expose the logic of this programme. For a full description of its implementation see Franco (1995).

The way this intuition was put at work in Brazil is worth describing. The first step, which developed between February and June 1994, had one main aim: the recoordination of agents on a single price index. Until then, indexation had been mostly a non-co-ordinated, decentralised process whereby contracts and prices were anchored on a wide variety of supports: the pace of adjustments could differ (monthly, weekly, etc), some classes of agents relied on a consumer index and others on a producer, or even a sectoral index, and regional indices were also widely used. In other words, the national money had not only lost the unit of account, it had also been fragmented. The Central Bank thus started to publish a new daily index - the *Unidade Real de Valor* (URV) –, which was linked *de facto* though not officially to the dollar. At the same time, it was imposed by law that all new contracts and all wages should be anchored solely on the new URV; strong incentives were also put in place in order to induce agents to convert old contracts into the new unit, especially financial contracts which carry the greater redistributive stakes.

The consequences were twofold: the on-going process of indexation at work since the mid-1960s' was almost fully completed, with the account and payment functions wholly separated; and the fragmented unit of account was re-unified or "re-nationalised", so that it became again a coherent public good. Everybody was again using the same unit of account, which supported the whole price structure, while paying only in the old unit of payment – the *cruzeiro*. In June 1994, the 48% inflation rate recorded in this unit virtually corresponded to an homothetic shift of the whole price structure. Payments, monetary policy and inflation would take place only in *cruzeiro* and relative price adjustments only in URV¹²: the economy had no monetary anchor anymore and monetary policy could not have any impact on relative prices and real term revenues.

Once this was achieved, a standard monetary reform could be implemented. On July 1st, the unit of payment function, i.e. the legal tender, was transferred on the URV, which became the Real and which replaced old *cruzeiro*. All payment obligations inscribed into contracts and financial assets were converted into the new Real, the old fiduciary money was withdrawn and the Central Bank started to conduct a monetary policy in Real as well as a foreign exchange policy. From 48% in June, monthly inflation in the going unit of payment fell to 7,8% in July and 1,9% in August, and it remained below 2% during the two following years. This sudden end of inflation, comparable to that witnessed in Germany in 1923 or in Israël in 1986, thus fully validated the original intellectual premises on which the programme was based.

From a theoretical point of view, a single, integrated monetary unit had been reconstructed which formally was as perfectly dis-indexed as the *cruzeiro*, at the end of June 1994, was fully indexed on the URV. The only open question was whether the new Real may have immediately lost *again* the unit of account function, which would have been spontaneously though invisibly transferred by agents on a *new* parasitic anchor - for instance the dollar, on which the UVR had been *de facto* anchored since February, at some risks. The response to this question could not be foretold, though policy decisions could bear on it. Remarkably, in this respect, Brazilian authorities kept as large a room for manoeuvre as possible, contrary to the Argentine, who had done everything to tie their hands, via the Board arrangement. In other words, policy discretion would contribute to strengthening the Real and monetary sovereignty.

Not only the Brazilian Central Bank remained one of the least independent among emerging economies. But little was said in 1994 as of the principles which would govern the daily management of the new Real. Instead of writing into the Constitution the exchange rate of the national currency, a rapid succession of policy rules was observed which *de facto* weakened the link to the American unit of account. Immediately when the UVR was transformed into the Real, the foreign exchange was floated and it appreciated up to 0,83 Real per dollar, despite

¹² Inflation in UVR was estimated at 3,7% between February and June, after Sachs and Zini (1995).

some interventions. Then a non-crawling though adjustable band system was established in March 1995, which was again operated with large, discretionary intra-band interventions. Finally, in January 1999, after a long fight against capital flight since the Russian default of August 1998, this regime was also abandoned: the Real was allowed to float and the Central Bank adopted a strategy of inflation targeting, which de facto put domestic instruments ahead of the exchange rate (Bogdanski et al. 2001, Franco 2000).

The 1999 crisis was arguably the most decisive test possible for the *Real*. It was the time when it finally became possible to assert whether the *Plano Real* had cured the economy only of its going rate of inflation, or whether it had also changed the underlying price mechanism, which produced inertia. That is, when confronted to a large shock on e.g. the foreign exchange, would the public hang to the new national money as a working unit of account, so that a permanent modification in relative prices would impose real term adjustments? Or, would people again adopt an alternate unit in order to protect themselves against revenue transfers? In this case, the Real would have failed to establish itself as an integrated national money and ratcheting-up inflation may rapidly re-emerge.

By the second quarter of 1999, the good news in Brazil was that the initial 35% depreciation in the exchange rate had only produced an 8% annualised inflation, which remained at that level till the end of the year; over the same period of time, the price of internationally traded-goods had increased by 11% and that of non-traded goods by 1,5%, delivering a 10% increase in terms of trade. For sure, the overall policy mix was very restrictive and world inflation low (IMF 1999, Baig and Goldfajn 2000, Bogdanski et al. 2001). This was however the best indication possible that after decades of high inflation, the reconstructed national money did not anymore transform all relative price adjustments into overall inflation: it had indeed recovered a capacity to affect durably the relative profitability of the traded and non-traded sectors; a textbook “J-curve” scenario of stabilisation and export-led growth could then progressively take hold¹³. Brazil had recovered a fully-fledged national money, which could i.a. help managing the conditions under which the national economy participates to international markets.

6. The 2002 Argentine disaster

Argentina was the one country on which the Real devaluation had the most negative impact: substantial trade integration within the Mercosur, plus the appreciation of the US dollars caused an adverse shock on foreign competitiveness and the beginning of a four-years recession. While real-term constraints were at first dominant, fiscal and monetary constraints then became more visible. Successive attempts at stabilisation in order to preserve access to IMF funding have had limited results, in a domestic political economic context which became increasingly conflictual¹⁴. In the three following years, the country-risk premium kept raising until the country lost access to international capital market (March 2001), before defaulting on its public debt (December). And with sterilisation impossible, growing capital outflows produced a drastic

¹³ As is now well-known, this does not imply that the country protected against self-fulfilling financial crisis or international contagion, which could certainly impose destructive shocks to the financial system, first of all via the public finances. But at least, the adjustment capacities of the Real as a unit of account were not anymore a specific source of durable price misalignments, resource misallocation and macro-financial tensions.

¹⁴ A large debate unfolded in 2002 on the main cause beyond the exit from the Board, which is not discussed here. One line of argument underlines the effect of exchange rate overvaluation and the slow adjustment of the real economy. Its main opponents emphasise the failure of the government to rain in deficits so as limit borrowing requirements ; the responsibility for the crisis is thus shifted from the private to the public sector, in an often transparent attempt to symbolically save from the disaster the dollar-peg strategy. See i.a. della Paolera and Taylor (2002), Mussa (2002), Fanelli and Heymann (2002), Haussman and Velasco (2002).

liquidity crunch: between December 1998 and December 2001, total credit to the private sector contracted by 23% - or 27% when taking into account price deflation.

A unique process of monetary disintegration then unfolded, along three different ways. First, in August 2001, parallel units of payment started to be issued on a large scale by the Province of Buenos Aires (the *patacon*) and many provinces. Although these insolvent and illiquid entities were excluded from capital markets and unable to call for the Central Bank's cash, they did not adjust their level of expenditures and their debt was not restructured. Hence, they started settling an increasing share of their payments obligations with this new type of securities - first of all their wage bill. These were actually no more than acknowledgements of payments arrears and, of course, they were not offered on an open market: civil servants had no other choice than accepting them as wage payment. However, in order to increase their value of usage, these securities also received some monetary capacities, as partial legal tender: they could be used in order to pay taxes and a number of enterprises, especially in the retail trade sector, started to accept them, generally at the local level¹⁵. After the country had been operating with two official monies since 1991, the unit of payment function was thus further fragmented, while braking loose from the State's authority.

In the last quarter of 2001, the widespread expectation of a coming exit from the Board triggered a full-size run on the banks, which depositors did not expect to resist the coming devaluation, due to their large dollar-liabilities. In the absence of a lender of last resort, the authorities were soon left with only one option: on December 3^d, tight controls on the conversion of bank deposits into cash were enacted (the *corralito*), and capital outflows soon followed; the Board was then abandoned (January 7th) and the exchange rate floated (January 11th), leading to a 72% loss of value of the peso against the dollar, in six months. The second victim of the monetary crisis was thus the payment system, through which agents settle decentralised transactions: domestic and foreign payments seized on a large scale during more than three months, so that the level of activity dropped further, in a context of widespread political and social crisis. Over the first half of 2002, GDP contracted by 15% vis-à-vis the year before, investment by 44% and imports by 56%.

At that point the strategic question, for the incoming government led by President Duhalde, was whether the newly floated peso had any chance to survive on an open market: that is, whether a viable exchange rate could be formed in the current context, just as for cars or T-shirts, or whether agents would rather opt discretely between two competing monetary institutions, which till then had been perfect substitutes – the dollar and the peso. In the latter case, the issue was not to choose a car, but whether to drive it on the left or the right side of the road, which is a choice of institution.

Floating the peso implied a sudden brake-up of a ten-year old institutional arrangement as of the underlying network externalities attached to the collective adherence to the bimonetary constitution. This was doomed to produce a highly unstable, two-equilibria situation: within a very short period of time, agents could fully reco-ordonate around one currency, while the value of the other would violently converge towards zero – guess which one. Hence, the main risk was not so much that of a return to hyperinflation, as was generally mentioned: it was the destruction of the peso on the foreign exchange market, with a domestic price explosion as a *consequence* of it – whether there would be or not a loss of control over money supply. This was the third component of the monetary crisis in Argentina: the national unit of account could be destroyed almost instantaneously, after the unit of payment had been fractured and the payment system frozen.

¹⁵ This monetary phenomenon has been recurrent in Argentina during the XIX^o century; see Bordo and Vegh (1998), Irigoin (2000), della Paolera et Taylor (2000), as well as during the 1980s, although on a more local scale. It also presents a number of common points with the experience of local and private monies in Russia, during the 1990s; see Ivanova and Wyplosz (1999), Woodruff (1999).

One rare historical experience sheds some light on this exceptional situation: the Hungarian hyperinflation after World War II, as analysed by Bomberger and Makinen (1983). In January 1946, at a time when current inflation was already very high, the Budapest government decided to index fiscal liabilities and the Treasury's own bank accounts on domestic inflation, in order to protect the real term value of its revenues. Shortly afterwards, the population was also granted the benefit of this institutional innovation and, latter on, an increasing share of public expenditures and services started to be priced in the new unit. In May, specific bank notes were issued so that what was initially a pure unit of account became also a mean of payment. The economy had thus become *de facto* bi-monetary and the population could freely arbitrate between a strong unit and an inflationary one – just like driving on the right or the left of the road. The result was striking: in July 1946 inflation in the un-protected money reached $4,2 \cdot 10^{16}$, which was probably a historical record; and at the end of the month, when that unit was withdrawn, the total corresponding monetary aggregate, for the whole country, could be converted on the black market against 2300 US dollars (ibid.).

This “Hungarian risk” highlights the strategies followed in Brazil and Argentina when they attempted to reconstruct a working national monetary order. In the former case, in 1994, a mix of incentives and legal obligations led to the progressive, mostly voluntary transmigration of prices and contracts onto the UVR, a bit like in Hungary in the first months of 1946. But contrary to this earlier experience, the Brazilians never allowed the non-inflationary unit of account to become a fully-fledged money, which would have made the economy bimonetary. Private agents thus had no other choice than to keep using the old, inflationary instrument of payment until its whole stock was exchanged for Reals, in a one-off, *non-market* conversion (1st July 1994). In other words, authorities did not loose control over the conditions under which the two units would be substituted, that is they never let the public arbitrate in a decentralised way between the strong and the weak money. They rightly considered that money is a public institution, not the n-1th good.

What did the Argentine government attempt in the first half of 2002? It first refused to dollarise the economy, as was defended by many experts, and it opted for its “pesification”: the conversion into pesos of all prices, wage contracts, financial assets, interbank payments, etc. In a much chaotic context, marked by an inconsiderate level of improvisation, the objective was to re-transfer on the sole peso the monetary functions which had largely been lost since the 1970s', before being officially and a-symmetrically shared with the dollar after 1991. In other words, both monies were not to be substitutes anymore: demand for the national money, hence its survival, would be supported by legal and institutional reforms, so that hopefully new monetary network externalities would coalesce around the peso. In other words, the approach would have to be much more top-down than in Brazil, and thus more delicate.

7. Pesification: real goods vs. financial wealth

This aim became explicit when pesification, which had first been envisaged as a voluntary, incentive-based process, was then imposed upon agents after February, at a given exchange rate. In a context of large-scale public and private insolvency, in the midst of a violent political and social crisis, the government was thus trying to achieve by law and heavy infringement into contracts, what the Brazilian one had obtained in 1994, with much less interventionist instruments and almost no redistributive impact. But this operation took place in the reverse direction: while the Plano Real had transferred the unit of payment function on a carefully reconstructed unit of account, pesification started from the old peso and tried to transfer on it the unit of account function.

At the end of 2002, the results were most remarkable as regard an institutional theory of money. The situation was neatly cut in two. On the one hand, the price for goods and services appeared

to have responded positively to “pesification”: the price for non-traded goods and wages had supported rather limited nominal increases, if any; and traded goods remained anchored on international prices, so that they incurred large increases in pesos. Terms of trade had thus adjusted in a massive way, as the respective markets had coalesced within a few months on the price mechanism which standard theory predicts. Of course this implied massive redistributive effects, in terms of living standards and distribution of income; but at least this opened a way out of the recession for the real economy, although a long and most painful one.

<<< Graph 3 >>>

All problems, on the other hand, were concentrated in the financial sector, where the change in the unit of account proved much more chaotic and destructive. Many agents in Argentina had large debts and asset contracts denominated in dollar, so that a fall in the exchange rate would have massive redistributive effects: dollars savers would become comparatively much richer, and vice-versa (provided one leaves in Argentina). Among these contracts, a first and large part was located abroad and could not be affected by legal initiatives in Argentine whatsoever (foreign deposits and debt): ensuing widespread defaults on foreign debts will affect for a long period of time the way the country may participate to international markets.

But the situation became probably even more intractable with domestic contracts, as a consequence of ill-advised policy initiative. Contrary to the spot market for wheat or hair-cuts, which may re-coordinate over one unit, in a one-off shift, financial contracts are by definition inter-temporal: they are built so that payment liabilities remain unchanged whatever the evolution of the environment. Changing their unit of account would either require requires time and incentives, as in Brazil in 1994, or at least a most careful, transparent intervention which should attempt to limit and make explicit redistributive impacts. In the Argentine context, the rational approach would have been that followed by F. D. Roosevelt in 1933, when he decided to leave the Gold Exchange Standard: he first suspended all possibilities for agents to arbitrage between dollars and gold and then cancelled by law the dollar clauses in all public and private financial contracts. This indeed forced an *ex ante* re-coordination around the dollar and established the monopoly of the dollar on the unit of account – as with the UVR in Brazil. Only then did Roosevelt float the dollar, without its depreciation having any massive redistributive effect on balance sheets (beyond the normal reflection of terms of trade adjustment on the relative profitability of sectors).

In Argentina, things did not develop as smoothly. First nobody suggested to pesificate contracts *before* floating the peso, mainly because all politicians kept repeating almost till the last hour that floating was out of question. Large redistributive effects had thus already taken place when pesification was decided (in February) and capital losses had become even more widespread and intractable. Right from the onset, the aims were twofold : pesification should rebuild a national money and it would reverse, or mitigate or reallocate individual valuation losses incurred as a consequence of the already-observed fall of the exchange rate. Instead of making everything possible to disentangle monetary (public) issues from wealth and solvency ones (i.e. private), the government engaged into a most confused and opaque process of redistributive engineering, which instrument was the manipulation of the unit of account of private contracts. Reshuffling capital losses between agents and sectors became the key political economic issue at stake.

Let’s just take two examples. One is the “asymmetric pesification” of banks’ balance sheet: in March and April 2002, dollar credits to enterprises were exchanged against peso debt at par, while dollar deposits benefited from a 1:1,4 rate, which was closer to the going market rate. In other words, rather than aiming at maximum transparency and neutrality, the change in the unit of account added a further degree of wealth redistribution, at the main benefit of enterprises. Consequently, already insolvent banks suffered an immediate capital loss as their liabilities and assets were exchanged at different rates. Hence the State decided to transfer them the equivalent of 15% of GDP in Treasury Bills, at a time when he was already in default, i.e. patently

insolvent. What is the actual value of this budgetary transfer? Have the banks become more or less insolvent after pesification? How can the households evaluate the net present value of their (partly frozen) deposits? Nobody knows. By the end of 2002, few in Argentina could actually measure their net wealth, except the majority which has nothing, and the happy few who have everything abroad.

The other redistributive manipulation of the unit of account derives from the decision, at the time of conversion, that the above-mentioned “peso-ised” bank credits would carry a 2% real interest rate, while the capital would be indexed on inflation. However the actual mechanism was not introduced at that time so that, by the end of 2002, nobody knew from which date actual revaluation would start. Would capital be indexed from the day the decree would be published? Or retroactively from the day of pesification? Or even from the day the peso was floated? At stake was a potential 40% *real term* (permanent) reevaluation of bank credits, i.e. an equivalent transfer of resources to banks which otherwise would count as enterprise wealth. It is thus no surprise that, again, violent proxy fights between interest groups and lobbies have dominated the whole scheme. And again the same questions are raised: who owns what? Who is solvent and who is bankrupt? Who may receive a credit and who should not? etc. The sheer impossibility to answer these questions, more than a year after the systemic crisis, was finally reflected in the on-going suspension of that central regulatory institutions in any capitalist economy : bankruptcy law, whether it applies to banks or enterprises. Rarely has monetary engineering lost so decisively any pretension to aim at a public good, though at the same time destroying the very basis on which a capitalist economy should rest.

8. Conclusion

The parallel experiences of Argentina and Brazil since the early 1990s have shed some light on the long-term impact of hyperinflation as on the conditions under which monetary functions can be re-integrated into self-sustained national money. In particular, this article has underlined how the choice of a substitute unit of account during inflation – external dollarisation vs. domestic indexation – has had an enduring impact: it has affected how inflation was accommodated, how it has been ended and the way monetary order was reconstructed. In turn these different institutional choices have entailed uneven capacities to run an independent monetary policy or to manage how the economy integrates international markets.

Contrary to the Brazilian Real, which successfully absorbed the 1999 foreign exchange crisis, the Argentine Currency Board did not resist exchange rate overvaluation and fiscal indiscipline after 1999. Highly rigid commitment devices only postponed the eventual exit and made the crisis more devastating, after December in 2001. At that time, the peso was again in the throes of a unique process of structural disintegration: the unit of payments was fragmented by local monies, the payment system was frozen and the unit of account came close to self-destruction. “Pesification” was then an attempt to re-integration of the unit of payment and unit of account into a single widely accepted national money, like in Brazil in 1994. But while the Plano Real had first stabilised the unit of account and relied upon limited State intervention into contracts pesification worked in reverse order : it built upon the old, now devalued unit of payment and it attempted to retransfer on it by law the unit of account function.

First came the good surprise: wages and the prices for goods were swiftly re-anchored on the peso and they adjusted remarkably. With due regard to the most limited legitimacy of public institutions at the time, this directly contradicts the standard view that acceptance of a national money is the sole effect of “confidence”, “anti-inflationary commitments” as of a capital of credibility, painfully accumulated in the Central Bank’ vaults. The very theoretical logic on which the Currency Board rested was thus invalidated in a much spectacular way : contrary to what successive governments had repeated for more than ten years, leaving the dollar-anchor

did not produce immediate hyperinflation. Even from an institutionalist perspective, the ease with which this operation succeeded and network externalities re-emerged is indeed surprising.

The main failure was in the treatment of dollar-denominated, financial contracts (deposits, debt, bonds, etc.): that is, contracts which are inter-temporal and which carry a large part of the domestic private wealth. Left unchanged, devaluation would have caused a massive, largely unbearable redistribution of wealth between savers and borrowers. But the migration of contracts on a new domestic unit could not take the decentralised, mostly incentive-based way observed in Brazil. Heavier State intervention into contracts would be necessary, incurring much greater risks. The main issue was not the so-called 'absolute sanctity of contracts' – which does not exist in any capitalist economy. It was the leeway it provided to political authorities and private agents once the rules of the games and the institutional guarantees of contracts were suspended. And indeed, in Argentina, in 2002, mandatory pesification opened up on pervasive and opaque manipulations of the unit of account, which extensively reallocated capital losses and private wealth. Public good was put in danger by the very first step towards pesification – the asymmetric exchange of credits and deposits.

This underlines the complex quality of money. It is a major public good *and* a public institution. It is not just an externality, although it also relies critically upon aggregation effects, most remarkably networks externalities: in order for it to acquire all its value, including that of a macroeconomic policy tool, it has to be widely adopted by agents in their transactions. The public institution is thus written into private contracts, which enforceability in turn is guaranteed by law – at least in modern capitalist economies. Hence the ideological sophism that the unit of account is now fully private and should be put out of reach of public authorities. And indeed private agents may dispose of it, as when they start rejecting the existing monetary institutions and substitute them in their contracts, individually or collectively. Conversely, when the drawbacks and constraints of a degraded monetary order becomes obvious to most, monetary reconstruction requires as well that contracts are re-written and that the public institution is re-instituted in them. This has been at the core of the Argentine and Brazilian experiences since the early 1990s'.

As we know, capitalism is not built solely on private initiatives and institutions, with the public sphere an external, artificial entity. It is critically founded on the interactions rules between private and public, which are not natural but historical: even within matured capitalist economies, this dividing line is moving and fragile, as it is drawn and defended by institutions which in turn can be contested and even rejected. And when these institutions – money to start with - are indeed in crisis, the responsibilities of public actors are of course magnified. This is where monetary stabilisation and reforms have repeatedly failed: when they have decisively blurred the relationship between public and private, rather than eventually preserving and strengthening this interaction rule, even at the cost of having it displaced, temporarily or not.

This is why monetary crisis belongs to those moments when the constitution of an economy is at stake and may threaten the social definition of agents. Institutions define rules for both private and public ones and, as such, they delineate their respective fields and principles of action. Agents are as well instituted, social entities. This is why much more than money is at stakes when private wealth is informally reallocated, when its measure and the possibility of micro-economic calculation become impossible, when eventually the norm of solvency and its sanction by bankruptcy are suspended.

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1- Argentina (in percentage)

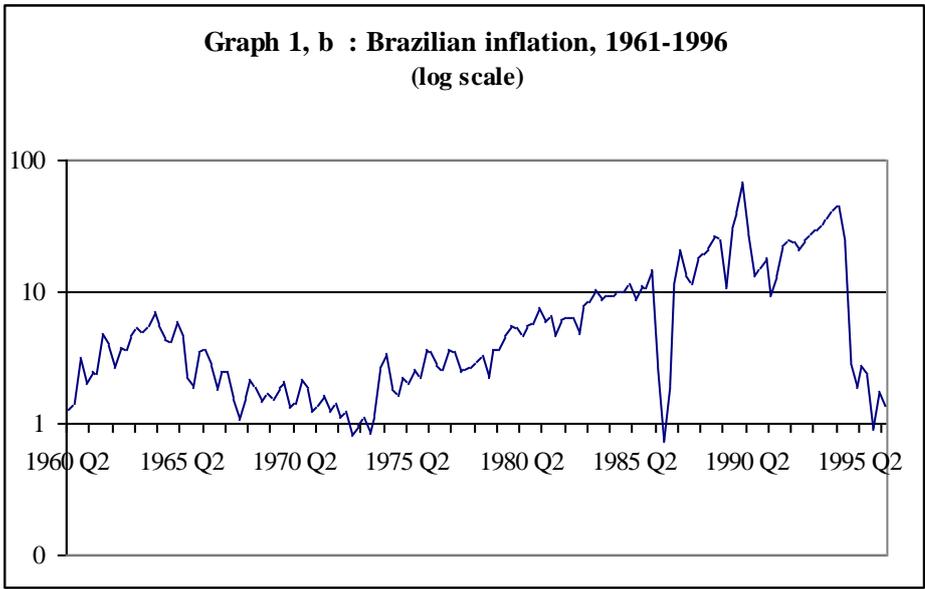
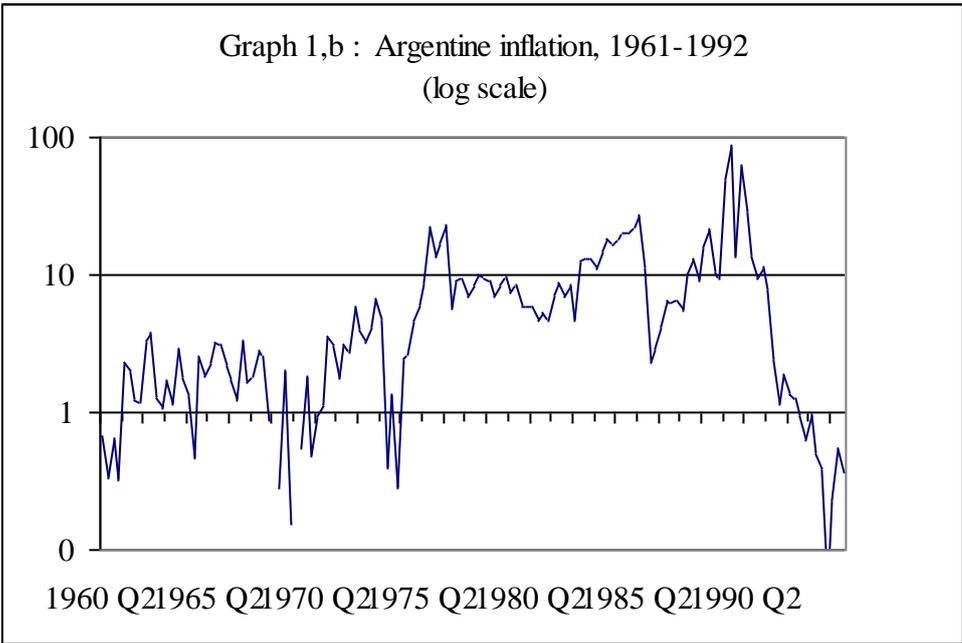
	GDP Growth	Public deficit	Inflation	Seignorage	Inflation tax on M1	M0/ gdp	M2/ gdp	Dom. Private Cdt/ gdp
1970-1979	3,2	5,5	132	8,9	5,1	14,9	16,4	11,4
1980-1985	-1,7	4,9	335	9,4	4,5	8,5	13,2	15,0
1986-1991	1,6	1,3	1021	5,4	3,9	6,1	10,4	11,0
1992-1996	4,8	0,8	35	0,5	0,3	8,6	17,3	17,1
1997-2001	0,7	1,6	-0,3	0,3	0,0	9,5	29,0	22,5

Sources: IMF, National Bank, author's calculations

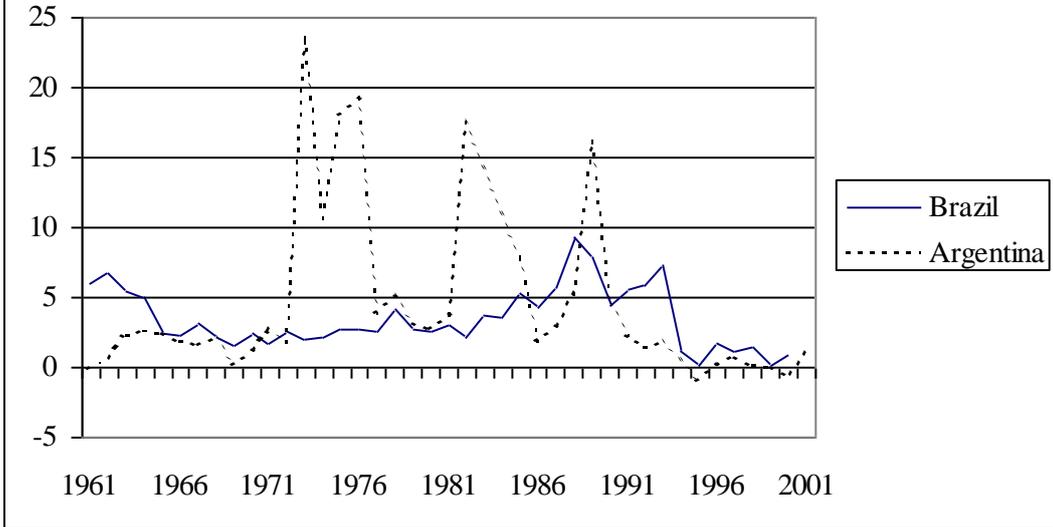
2- Brazil (in percentage)

	GDP Growth	Public deficit	Inflation (% of gdp)	Seignorage (% of gdp)	Inflation tax on M1	M0/ gdp	M2/ gdp	Dom. Cdt to enterp. / gdp
1970-1979	8,0	-0,4	32	2,4	2,1	8,4	14,0	21,9
1980-1985	2,8	-4,7	150	2,9	2,7	4,1	7,3	17,3
1986-1991	2,6	-10,9	903	6,1	4,5	4,6	13,9	22,6
1992-1996	3,4	-6,4	1067	4,0	2,0	5,5	24,5	27,4
1997-2001	1,3	-6,8	5,9	1,1	0,2	8,3	28,1	28,7

Sources: IMF, National Bank, author's calculations



Graph 2 : Seigniorage, 1961-2001
(in gdp %)



Graph 3 : terms of trade in Argentina, 2002

