

## The real plan thirty years later

Selected policy afterthoughts<sup>1</sup>

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The 30<sup>th</sup> year celebrations of the Real Plan have been surprisingly intense, especially considering the relatively discrete passing of important ephemerids such as 15<sup>th</sup>, 18<sup>th</sup>, 20<sup>th</sup>, 21<sup>st</sup> or 25<sup>th</sup>. Indeed, 30 years is more than enough time to define a successful stabilization. But so is 20 or even 10. What is so especial with the 30<sup>th</sup> year?

Although precise dating is always open to debate, one can reasonable assume that stabilization was consolidated at about year 8 or 9, when free elections brought the Plan's adversaries into government. Democracy ran its course and agendas rotated with no consequence to the currency, besides the usual election volatility. Even though one can never speak of inflation as finished business, and the same about reforms, it is safe to assume that, aged 30, the Real Plan and hyperinflation are History.

Strangely, however, it was only after 30 years that the Real Plan enjoyed some celebration. Journalist Ivan Lessa once said that every 15 years Brazil forgets everything about the last 15 years. The new and interesting finding has been that, at every 30 years, everyone remembers something cool that should not have been forgotten<sup>3</sup>.

The real is technically the longest and most well behaved of all monetary standards Brazil had since 1942<sup>4</sup>. After more than sixty years of experimentation

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<sup>3</sup> In fact, the best theory for the unusual enthusiasm with the 30<sup>th</sup> anniversary of the Real Plan is that it sounds a lot like a protest, given President Lula's historic adversarial position with it. More to the actuality of the Real Plan in in G. H. B. Franco (org.) with Edmar Bacha and Pedro S. Malan. *30 anos do Real: crônicas no calor do momento*. Rio de Janeiro, História Real, 2024.

<sup>4</sup> The same could be said for the longer period, starting at Independence (1822). This might be debatable as one enters comparisons between the fiat money standards of the late twentieth century with the different occasions Brazil was on and off the gold standard discipline, at different parities (each being considered a

and error, the 1994 monetary reform finally brought the long sought institutional solution for the design of a fiduciary monetary system after the demise of the gold standard<sup>5</sup>.

There is now a nearly unanimous benign look at the Real Plan, perhaps for the very simple fact that *it worked*, and it did it under the direst circumstances: it was a hyperinflation, as people timidly recognize only now, at a safe distance. It was difficult to talk about it back then. This new attitude is much welcome by those involved, who withstood several years of criticism and reservations.

It is tempting to take advantage of these new positive perspectives to overdo in offering lessons. The record of success elevates recommendations to a higher level of authority, yet what follows is limited to a modest collection of architectural afterthoughts, on some selected issues related to initial moves, including diagnosing, and navigating under low visibility. All this with a focus on the role played by the exchange rate, the most controversial issue all along.

The exchange rate has been crucial to opening moves and as an “anchor”<sup>6</sup>, as commonly designated, to buy time or to open windows for fundamental reforms to take place, for fiscal adjustment to become effective and for indexation detoxication to proceed. After thirty years, one can go beyond the first steps and assess the whole picture, or how the effort came to completion, and with what results.

The Real Plan’s success has much to do with the interplay between short term market interventions with expectations (and, of course, delivery) on fundamental fiscal adjustments and reforms. Opening moves are critical in fighting big inflations, much like in a chess game. The stabilization game usually goes on for few years, possibly a decade, with several twists and variations. A good opening, however important, does not secure success, but a bad one brings failure very quickly. The record seems to show that in fighting hyperinflations in general, as in currency reforms, the exchange rate is the central piece in the opening moves. There is no exception here.

There is no denying that the work on *fundamentals* will ultimately determine success or failure, and that there are always several difficult battles in these fields: fiscal accounts in their immeasurable features, the pace and politics of

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standard), and the frequent spells of inconvertible paper during the nineteenth century. As for the years after 1942, the numbers can be confirmed in Table 4.

<sup>5</sup> For historical perspectives and details to institutional developments in Brazil see Gustavo H. B. Franco. *A moeda e a lei: uma história monetária brasileira, 1933-2013*. Rio de Janeiro, Editora Zahar, 2017.

<sup>6</sup> For a description of the role of the exchange rate in the Real Plan’s architecture and its developments until 1999 see G. H. B. Franco. “The real plan and the exchange rate” *Essays in International Finance* n.217, April 2000. International Finance Section, Department of Economics Princeton University.

many reforms and on constitutional changes. The success of stabilization hinges on all this, or some relevant subset of accomplishments in these fields through time and very often a good start helps opening the doors to these developments.

Interestingly, however, the opening move should not be *too good*, as it may easily bring complacency. Veterans of the 1986 Cruzado Plan often brought this message in connection with the experience with a price freeze. The effects of the price freeze were so incredibly popular, and so powerful to politicians, that they lost entirely the incentives to do the rest. It seemed *sufficient*. Popularity was secured, so that fiscal and other adjustments were sidelined. Left to his own devices, the price freeze collapsed, along with the Cruzado Plan.

The bitter lesson was simple: do not engineer a nice *first move* without securing that politicians would deliver their part. Nevertheless, Brazil repeated the plot, and tried a price freeze unsuccessfully in *four* other occasions after the Cruzado Plan: 1987, 1989, 1990, and 1991. Even knowing that it would work only for a few months (weeks?) and then collapse badly, politicians liked the formula as they seem to dominate the art of distancing themselves from the debacle and from inflation in general.

Reading through President Itamar Franco' mind in 1993, the impression was that Brazil could very well try it again. No doubt, the price freeze was politicians' (including PSDB leaders) preferred first move; it was also a "plan B" to be launched at discretion if politically viable alternative were not produced or if Cardoso and his team leave the room.

Seen in its details, the Real Plan is much less an exchange rate-based stabilization than it is accused to. It did *not* comprise a currency board or the fixing of the exchange rate, as usual to "back to gold" programs in the 1920s, or as in the Argentina's 1991 convertibility program, unquestionably the most common recommendation coming from Washington at the time.

The initial moves for the Real Plan were just different and unexpected, although also a combination of actions on foreign exchange markets and of modifications on the design and governance of monetary institutions.

Instead of fixing the exchange rate, the currency was *floating and appreciating*. Nobody would be impressed by the Central Bank intervening to fix the exchange rate at least for a while. But to have an appreciation as a market outcome in the context of free floating was entirely new.

Second, instead of a currency board, the Real Plan brought a comprehensive reform on money governance, an institutional rearrangement bringing alterations in the National Monetary Council (*CMN- Conselho Monetário Nacional*) and later the creation of monetary policy committee (*COPOM – Comitê de Política Monetária do Banco Central do Brasil*)<sup>7</sup>, all pointing towards much maligned central bank independence.

The practical impact of improved money governance, and of Central Bank *de facto* independence, was clear in the monetary policy moves at the onset of the new currency. It was clear that the Central Bank was completely free to do *whatever it takes* for the plan to work. The opening overnight interest rate starting the month of July, the first of the new currency, was 8% per month (approximately 152% per annum). It was very high even for the Brazilian standards of the time.

However high, though, absent *formal* central bank independence, the commitment to these policies would depend very much on political continuity. In the beginning of July 1994 Cardoso was already at the presidential race (he had left the Finance Ministry in April to run), with 21% of voting intentions, against Lula with 38%. One month later, Cardoso was leading the polls (36% *vs.* 29%), with the support to the Real Plan at 75%<sup>8</sup>, and went on a first-round victory (54,28% *vs.* 27,04%) at the October 3<sup>rd</sup> elections.

In parallel, letting the currency freely appreciate in July 1994 turned out to be a key starting move to conquer support to the plan. It was more than that: it was also a major step towards *deindexation* as it was a crowning moment to several years of FX deregulation and dismantling exchange controls. The exchange rate would be given by market forces and no longer by an indexation rule following purchasing power parity, that is, past inflation *minus* US inflation. Floating was a big part of deindexing.

Floating the exchange rate removed a key relative price rigidity typical of high inflation environments: every nominal change in any price, under hyperinflation, is primarily attributable to inflation and automatically correctable with an offsetting readjustment. It is like relative prices changes are hardly visible, or relevant, so that all the attention goes into readjustments.

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<sup>7</sup> For details see Franco, *A moeda e a lei, op. cit.* chapter 8.

<sup>8</sup> R. R. Figueiredo “Mídia e eleições: cobertura jornalística da campanha presidencial de 1994” *Opinião Pública*, Campinas, vol. V, nº 1, November, 1998, p.84-85

Floating the exchange rate in July 1994 was a huge success as the new currency appreciated with respect to the Dollar at the free market. At a point, the new currency was said to *worth more than a dollar*, but as a spontaneous market outcome and not by virtue of the authorities' intervention. Cosmetic as it may seem, it expressed confidence in the plan like nothing else.

On the other hand, the positive impact of currency appreciation under floating also served to paralyze those still pressuring towards a price freeze. It was powerful because it was a unincumbered result of market forces in line with the plan's dispositions regarding contracts' conversion into the new currency, mostly but not all based on voluntary adhesion and individual incentives. It was also the natural continuation of the efforts in previous years towards deregulation and market determination of exchange rates.

It may not have had the popular impact of the price freeze, but it was close and with the advantage of not weakening politicians' incentives to behave. Foreign exchange market outcomes are easily reversible, this meaning an *exit strategy* would be available, if needed, in contrast to the currency board "no other way" philosophy<sup>9</sup>.

In addition, the move brought markets into the game, a new departure to Brazilian politics. Markets would track reforms and fiscal policies' every move, and reacting real time, much to politicians' annoyance thus, through their movements, punishing any signs of complacency on addressing *fundamentals*, but also applauding reforms. That was new and powerful.

Stabilization critics were perplexed with the Real Plan's early moves and reacted *as if* Brazil was doing a replica of the Argentine convertibility plan. They were prepared to adopt a nationalistic stance<sup>10</sup>, that proved totally awkward considering what was taking place at the foreign exchange market. Efforts were redirected toward criticizing exchange rate appreciation, mostly on balance of payments and on protectionist grounds. Later the complaint was converted into the thesis by which the foreign exchange "anchor", although admittedly essential, was held up too long, so that the appreciation spell lasted longer than necessary<sup>11</sup>. Of course, it is never explained how the plan would have obtained

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<sup>9</sup> Here is another lesson for stabilizations' first moves: do not do anything irreversible. A market-based appreciation is just perfectly reversible by the exact same mechanism on its origin.

<sup>10</sup> A remarkable reference was a volume of essays organized by L. G. M. Belluzzo & P. Nogueira Batista Jr. (eds.) *A luta pela sobrevivência da moeda nacional; ensaios em homenagem a Dilson Funaro*. Rio de Janeiro, Paz e Terra, 1992.

<sup>11</sup> As, for example, in A. Ferreira & G. Tullio. "The Brazilian exchange rate crisis of January 1999". *Journal of Latin American Studies* vol. 34 (1), February 2002, pp. 143-164: "The exchange rate-based stabilization pursued

the same anti-inflationary results had the foreign exchange policy been different, to what degree and when.

The exchange rate was indeed a key tactical device and yes it was used to the limit in the early years, when Brazil was facing a capital surge and the fiscal effort seemed every inch short of what it should be, and reforms also appeared to be distant and marching slow. Moreover, starting with a reversible move, instead of a “no exit” attitude, resulted very useful for a low visibility flight under stormy weather. Preserving options was key to a process that is essentially path dependent and that may have many ways to proceed and succeed<sup>12</sup>.

In parallel, sustaining *expectations of reforms* was demonstrably essential to stabilization, as an indication of the belief that *fundamentals* were addressed. The idea that the reforms cavalry was coming was a very essential part of confidence building, as expressed in foreign exchange markets on day one. Building up reserves and taking advantage of a capital surge was also key, as it may take long to deliver all reform promises. The hopes could be kept alive if one sees a knight riding every afternoon and if the perceived horizon of current policies is long and may be extended if necessary.

There must be news on reforms every day.

Some reforms are delivered fast (as, for instance, in monetary governance), other in steps (privatization, company by company, banks’ adjustment, one by one), and others in protracted parliamentary debates (*e. g.* social security changes). Time (to work on fundamentals) is of the essence and admittedly a scarce resource, always under pressure by people’s anxiety.

But there must be advances every day.

Eventually the cavalry must show up, of course, promises should be kept, especially when it comes to credibility building. It is indeed crucial not to distract cavalry commanders from their mission.

Stabilization plans would be easy deals if some magic “regime change” straightening “fundamentals” materializes beforehand. That happens, however, only in textbooks.

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by Brazil after the hyperinflation was the most reasonable policy to follow and can be considered successful. However, it was pursued for too long at the cost of a large loss in competitiveness first and of economic growth later.”

<sup>12</sup> Noteworthy that some fatigue in the Argentine plan could be seen at this point, signaling that the ability to change strategies was key to the stabilization process.

Interestingly, *ex ante* expert advice often falls into banalities like “get the fundamentals right first” or “just stop printing money”, as if locals were not pushing the right buttons. It is just not like the way it works. High inflation is a major social problem, not mismanagement by distraction, negligence, or carelessness<sup>13</sup>.

In real life, stabilization plans are about execution and delivering, policy and reforms, under way less than ideal conditions over several years facing major problems to be addressed over extended periods. It is like flying through thick fog with poor instruments.

As a matter of fact, since plan makers were keenly aware that they are not going to get the *fundamentals* right from the start, it was even more important to start well and sustain the momentum. Exactly like the opening moves in a chess game when you know your adversary is a Russian master who will eat you for lunch on your every mistake.

Opening moves can get you at the front door of victory. Or to the bottom of the sea. Controlling the centerboard may open the gates for *fundamentals* to be set right later at midgame. Or not. Things can very well be ruined in the sequence. There are no guaranties. In fact, the best sports analogy might be that of a long season, or a prolonged tournament, with multiple matches in which many games are going to be losses, but points are accumulated in consequence of virtues not much celebrated like defense, consistency, and regularity.

Ultimately, during the fifth year of the new currency, with very good results in the inflation front, the Real Plan faced questions as to the sustainability of the exchange rate “anchor” and of the stabilization effort at large. Events in Asia and Russia heightened these concerns. Many progresses in fundamentals had been accomplished and though with hesitations Brazil was rushed into a renewed mix (the *tripé*, as called) comprising a strong primary surplus (to the tune of 3% of GDP and IMF monitoring), the adoption of inflation targets as the new “anchor” and the move to a float with a heavy adjustment in exchange rates. What would happen with inflation after that? Was it a different organism five years into the treatment? Has the tolerance to relative price movements been changed? Did deindexation change anything?

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<sup>13</sup> This seems to have found some supporting empirical evidence, as per José Luis Saboin-García “The Modern Hyperinflation Cycle: Some New Empirical Regularities”. *International Monetary Fund Working Paper Series* n.18/266, December 2018.

These notes are organized into 7 sections. The first two refer to diagnosis, on which there cannot be any mistake. Hyperinflations and currency reforms are very complex issues on which, however, there is plenty of experience to draw from. Diagnosing is not simple when it comes to big inflations, as denialism is present every step of the way.

The first section explains what a hyperinflation is, implicitly arguing that these cases are singular to the point of requiring a very especial treatment. A currency collapse normally leads to a currency reform, the subject of section two. The third section deals with some of the practical aspects of currency reform, a very important and often downplayed aspect of the hyperinflation & stabilization process. The fourth section considers precedents with indexed currencies and the Brazilian solution through the URV (*Unidade Real de Valor*) the indexed money of account that became the new currency on July 1st, 1994. There are numerous peculiarities in the URV construction and on what happens when the indexed unit of account becomes the national currency and floats with respect to the Dollar.

Section five discusses actions on *fundamentals* and how these actions interplayed with aspects of the Real Plan sometimes considered artificial and cosmetic. Section six addresses the record, or the results, and brings an assessment to the episode. Inflation numbers should provide the ultimate metrics for the success of the effort. Lastly, section seven sums up and offers some thoughts as to the Real Plan's legacy.

## **(1) What is a hyperinflation? How important is the diagnostic?**

One common presumption about hyperinflations is that they can be defined the same way US Supreme Court Justice Potter Stewart famously defined *obscenity (hardcore pornography)*: “I know it when I see it”, was his remark on a judgement in connection of a Louis Malle movie<sup>14</sup>.

However, this wisdom does not seem to apply to hyperinflations, as many of the stakeholders prefer not to see it. Indeed, denial is a very crucial theme in fighting hyperinflations. Interested parties always struggle to be out of the definition, as if the diagnostic would be an unconditional surrender to orthodoxy, to conventional medicine or to rehab. Yet, a precise diagnosis might

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<sup>14</sup> Jacobelis vs Ohio case on alleged obscenity in Louis Malle's *Les Amants*, a 1958 production with Jeanne Moreau and Alain Cury at leading roles.



be just indispensable. To the addicted or to the recalcitrant inflationist unconditional surrender may be just essential.

The Brazilian experience had at least one curiosity to this respect, reinforcing the denial propensity: it was kind of forbidden to employ the H word, at least in the beginning<sup>15</sup>, like it would be recognition of a disease too serious, possibly terminal, or a shameful addiction. Political leadership was afraid of that and did not want to alarm the public, or to face the consequences.

The H concept emerged much earlier in academia, most notably in Cagan 1956 study, in a famous essay in a collection organized by Milton Friedman, himself at the very center of the monetarist revolution<sup>16</sup>. But political implications of the H word were far beyond economics: most politicians had strong fears of the political consequences of monetary disorder. The nazi ascent in Germany was a giant ghost in their minds and a reminder of how serious inflation consequences could become. Most often, however, these risks are never to be openly admitted.

Cagan studied seven episodes of extremely high inflation, taking place after the world wars, first and second. “Extreme” meant inconceivably high, and his definition for the phenomenon, as distinct from regular inflations, was simple and powerful: one hyperinflation episode *starts* the moment inflation rates reach *50% per month (12,875% per year)*. It ends when this level is lost for one year at least. It was a simple rule, more to delimitate a relevant portion of a time series than a deep conceptual construction.

But 50% became the norm.

A 2002 study, organized by Stanley Fischer and associates<sup>17</sup>, collected data on other more recent cases around the world to sum 24 episodes of Cagan hyperinflations up to that moment, all pictured in Table 1, ranked by cumulative inflation observed during the episode, from the worst to the lowest number. Occurrences have become rarer since; perhaps only a couple to add, Zimbabwe (2007) and Venezuela (2017)<sup>18</sup>.

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<sup>15</sup> The word “superinflação” (literal translation into *superinflation*) was especially crafted to this purpose and even employed in some official documents. Cf. *Franco A moeda e a lei, op. cit.* p.530.

<sup>16</sup> Philip Cagan “The Monetary Dynamics of Hyperinflation”, in Milton Friedman (org.) *Studies in the Quantity Theory of Money*. Chicago: University of Chicago Press, 1956.

<sup>17</sup> S. Fischer, R. Sahay & C. A. Végh “Modern Hyper- and High Inflation” *Journal of Economic Literature* Vol. XL (September 2002) pp. 837–880

<sup>18</sup> According to Saboin-Garcia, *op. cit.*, p.5.

Table 1. Cagan hyperinflations

	countries	period		duration	inflation
		starts	ends		cumulative
1	Hungary	ago/45	jul/46	12	3,8 x 10 <sup>27</sup>
2	China	set/45	mai/49	44	10.434.703.221.306
3	Nicaragua	jun/86	mar/91	58	11.895.866.143
4	Germany	ago/22	nov/23	16	10.115.776.266
5	Greece	nov/43	nov/44	11	2.197.771.119
6	Serbia	fev/93	jan/94	12	156.312.790
7	Soviet Union	dez/21	jan/24	26	12.399.023
8	Ukraine	abr/91	nov/94	44	1.864.714
9	Peru	jan/89	set/90	21	573.377
10	Bolivia	abr/84	set/85	18	97.282
11	Georgia	set/93	set/94	13	76.219
12	Poland	jan/23	jan/24	11	69.886
13	Congo	nov/93	set/94	11	69.502
14	Angola	dez/94	jun/96	19	62.446
15	Azerbaijan	dez/92	dez/94	25	41.742
16	Armenia	out/93	dez/94	15	34.158
17	Argentina	mai/89	mar/90	11	15.167
18	Congo	out/91	set/92	12	7.689
19	Austria	out/21	ago/22	11	6.878
20	Hungary	mar/23	fev/24	10	4.301
21	Tajkistan	abr/93	dez/93	9	3.636
22	Tajkistan	ago/95	dez/95	5	839
23	<b>Brazil</b>	<b>dez/89</b>	<b>mar/90</b>	<b>4</b>	<b>693</b>
24	Turkmenistan	nov/95	jan/96	3	291

SOURCES: S. Fischer, R. Sahay & C. A. Végh “Modern Hyper- and High Inflations” *Journal of Economic Literature* Vol. XL (September 2002) p. 840. Philip Cagan “The Monetary Dynamics of Hyperinflation”, in Milton Friedman (org.) *Studies in the Quantity Theory of Money*. Chicago: University of Chicago Press, 1956, p. 26.

There is really not much theory on Cagan hyperinflation concept, particularly to establish the 50% per month threshold. Cagan himself, years later in writing the hyperinflation entry in the Palgrave dictionary dismissed the notion of a threshold<sup>19</sup>.

Did Brazil really experience a hyperinflation?

<sup>19</sup> P. Cagan. “Hyperinflation”, in John Eatwell *et al.* (org.), *The New Palgrave: The World of Economics*. London, Macmillan, 1987, 1991, p. 339: “Hyperinflation is an extremely rapid rise in the general level of prices of goods and services. It typically lasts a few years or in the more extreme cases much less before moderating and ending. There is no defined threshold. It is best described by a listing of cases, which vary enormously.”

Table 1 would make it appear very exceptional: only a four-month episode, together with several more extravagant cases in the context of wars and revolutions. The starting month of the Brazilian episode was December 1989, exactly the month of the second round of the country's first direct presidential elections in three decades, at the final months of the so called "Nova República" (José Sarney presidency).

Does this modest participation in Table 1 reflect properly the dimension of the inflation problem in Brazil?

One must bear in mind the strength of the perception that Brazil learned to live with inflation, and even to take profit from it, such was the variety and sophistication of indexation (monetary correction as designated in Brazil) clauses and mechanisms all over the place. There was no trace of money illusion anywhere. Consciousness of the problem was widespread; the illusion was somewhere else, namely, that protection from inflation was really effective. The addicted displays an apparent normalcy in his life and habits while using his drug and thinks he is in control.

It was part of this culture to argue that hyperinflation was *not* a fair description of what was going on in Brazil, but, instead, a pathology only to be found in more confused countries, troubled by wars and earthquakes, not to be found in Brazil. The addicted always resists to acknowledge his condition.

But what if one lowers the 50% monthly threshold? Famously, Michael Bruno had argued that "for its most important attributes a broader definition of hyperinflation as 25% a month will also hold"<sup>20</sup>.

In their now classic 2002 survey, Stanley Fischer and associates worked a new threshold of what they called simply "high inflations", episodes of which would start when inflation reaches 100% per year (5.9% per month) on 12-month cumulative basis.

One should think very hard on what is exactly the qualitative difference between "high" and "hyper". Fischer explains that "high" or "hyper" are generally taken to be episodes of triple digit annual rates. Or inflations that are "sufficiently disruptive that in practice virtually no country has been willing to live with them for more than a few years"<sup>21</sup>.

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<sup>20</sup> Michael Bruno. *Crisis, stabilization and reform: therapy by consensus*. Oxford, Clarendon Press, 1993, p.4.

<sup>21</sup> Fischer *et al*, *op. cit.* p.841.

There might be many subjective definitions of hyperinflations. Such as ones that are beyond conventional inflation fighting techniques (through a ride in the Phillips' Curve trade-off, or through inflation targets).

Another is that a hyperinflation starts at a moment in which *monthly* rates of inflation are on everybody's minds, instead of *annual* rates of inflation.

Indeed, as admitted by Cagan himself, there seems to be no well-defined threshold.

Fischer and associates collected 45 such cases of 'high inflation', sometimes encompassing Cagan episodes, as displayed in Table 2.

Ranked according to cumulative inflation (a measure than considers *size and duration* of the episode), two "peacetime" cases, Brazil, and Argentina, stand at the very top.

Table 2. Fischer High Inflations

	country	starts	ends	duration	cumulative
1	Brazil	April-80	May-95	183,6	20.759.903.275.651
2	Argentina	July-74	October-91	210,0	3.809.187.961.396
3	Nicaragua	May-84	February-92	94,4	288.735.412.719
4	Congo	December-89	December-96	85,2	88.510.051.965
5	Angola	January-91	June-97	78,1	287.726.172
6	Peru	December-86	March-92	63,9	25.392.223
7	Bolivia	August-81	August-86	60,9	5.220.261
8	Chile	October-71	May-77	68,0	127.958
9	Israel	December-78	March-86	88,2	109.187
10	Zambia	August-88	March-94	67,9	11.713
11	Uganda	February-84	December-88	58,8	9.071
12	Suriname	April-92	October-95	42,6	4.559
13	Sudan	February-90	June-94	52,7	2.715
14	Lebanon	August-85	August-88	36,5	2.345
15	Peru	June-82	April-86	46,7	1.953
16	Mexico	December-85	August-88	32,5	724
17	Sierra Leone	February-89	February-91	24,3	689
18	Ghana	May-76	February-79	33,5	567
19	Uruguay	June-89	August-91	26,4	414
20	Somalia	October-87	November-89	25,4	388
21	Uruguay	October-66	October-68	24,4	336
22	Congo	February-78	August-80	30,4	317
23	Turkey	May-93	March-95	22,3	269
24	Ghana	February-80	December-81	22,3	257
25	Uruguay	December-71	September-73	21,3	256
26	Ghana	May-82	February-84	21,4	243
27	Congo	February-88	July-89	17,2	202
28	Turkey	March-79	September-80	18,3	199
29	Mexico	February-82	July-83	17,2	180
30	Venezuela	July-95	December-96	17,3	161
31	Uganda	February-81	April-82	14,1	160
32	Congo	July-86	December-87	17,3	146
33	Congo	October-82	January-84	15,2	146
34	Guinea-Bissau	September-86	February-88	17,3	146
35	Sierra Leone	November-86	December-87	13,2	144
36	Somalia	March-83	June-84	15,3	140
37	Jamaica	April-91	May-92	13,2	124
38	Costa Rica	September-81	October-82	13,2	120
39	Lebanon	August-91	December-92	16,3	118
40	Afghanistan	July-88	June-89	11	109
41	Afghanistan	February-85	October-86	20	109
42	Uruguay	January-74	December-74	11,1	107
43	Venezuela	June-88	May-89	11,1	103
44	Congo	March-67	February-68	11,2	101
45	Lebanon	March-90	February-91	11,2	100

SOURCE: S. Fischer, R. Sahay & C. A. Végh "Modern Hyper- and High Inflations" *Journal of Economic Literature* Vol. XL (September 2002) p. 874.

Peacetime currency collapses are indeed possible. They might well be the worst and more complex cases to explain and resolve.

An important footnote to these experiences is to highlight the few cases of *explosive inflations*, as pictured in Table 3: inflations of 1000% in one single month in more than one month.

Table 3. Explosive inflations

Germany		Hungary		Greece		Soviet Union	
1923	%	1945/46	%	1944	%	1923/24	%
Jan-Mar	69	Sep-Nov	366	Jan-Mar	127	Apr-Jun	37
Apr-Jun	44	Dec-Feb	265	Apr-Jun	114	Jul-Sep	62
Jun	100	Feb	503	Jun	145	Sep	72
Jul	392	Mar	329	Jul	121	Oct	97
Aug	1.457	Apr	1.820	Aug	534	Nov	67
Sep	2.460	May	30.140	Sep	1.917	Dec	110
Oct	24.300	Jun	8.440.000	Oct	7.459	Jan	136
Nov	17.851	Jul	41.881 trillion	Nov	4.614	Feb	213

SOURCE: Gustavo H. B. Franco. *A moeda e a lei: uma história monetária brasileira, 1933-2013*. Rio de Janeiro, Editora Zahar, 2017, p. 559, Tabela 8.1.

These cases are not mere curiosities, but warnings on what can go wrong in currency reforms, an inevitable but dangerous medication when it comes to hyperinflations. In three of these cases (1923 Germany, 1946 Hungary and 1944 Greece) the explosion was caused by the existence of two (or more) competing currencies usable as means of payment. This may have provoked a Gresham's Law widespread rejection of the inferior option, thus a terminal runaway inflation of the lower quality currency.

This may look extreme and rare, but it is revealing as to the mechanics of currency reform, or the dangers involved when two currencies interact. Brazil had been entertaining the use of an indexed currency since the mid1980s<sup>22</sup>; these precedents cannot be ignored.

The German experience was very rich and well documented. It helped to feed the debates in Brazil on indexed currencies. A very interesting and singular feature of the German hyperinflationary experience was the spread of private "stable valued (indexed)" emergency currencies (*wertbeständiges notgeld*) to serve

<sup>22</sup> After the publication of the seminal paper by P. Arida e A. P. Lara Rezende, "Inertial Inflation and Monetary Reform: Brazil", in John Williamson (org.) *Inflation and Indexation: Argentina, Brazil and Israel*. Washington, Institute for International Economics, 1985. In his comments to the paper Rudiger Dornbush coined the term "Larida Proposal" (p.48) later popularized.

as means of payment. This was unique: more than four thousand different *notgeld* issues of the most varied sizes, formats and issuers could be traced. It was monetary collapse to which the government responded by issuing its own “stable currency”, the *rentenmark*, directly competing with the old *reischmarks*. This led to the explosion of inflation in the old currency in the Summer of 1923, and the iconic imagery of wheelbarrows full of valueless paper money. Yet, the *rentenmark* became the national currency, this being one of the most singular aspects of this experience, not often well understood and frequently described as a miracle<sup>23</sup>.

The Hungarian experience with an indexed currency in 1946 produced the most superlative inflation numbers ever seen. According to Table 1, during the 12 months episode’s duration average monthly inflation rates approached 200%, and in the worst month we had the world record:  $41.9 \times 10^{15}$  % (4,190,000,000,000,000) in one single month (that translates into 232% per day and 5,1% per hour). This is indeed an unbearable risk when it comes to designing currency reform using indexed currencies.

The URSS implemented a scheme much like the German *rentenmark* with the *chervonetz*, but in much smaller scale, not producing an explosion of inflation in the old currency, just a significant acceleration<sup>24</sup>. The Soviet case may hint that there is a critical issue size for an indexed currency, or indexed money substitutes, to trigger an inflation explosion of the regular currency. Respectful of these risks, the architects of the Real Plan preferred to avoid altogether the coexistence of two means of payments.

Back to the key point of this section, the hyperinflation definition and diagnosis: hyperinflation is a phenomenon beyond the Phillips curve, not to be fought only with ordinary monetary policy. Experience tends to suggest that a currency collapse may only be solved with a new currency, the subject of the next section.

## (2) Varieties of currency reforms and the Brazilian record

There have been several such episodes around the world, many connected to currency collapses, but not all. The most important currency reform in the last one hundred years was the Euro, an experiment that had nothing to do with

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<sup>23</sup> On this particular mechanism see G. H. B. Franco. (1987) “The Rentenmark Miracle” *Rivista di Storia Economica*. Second Series, vol.4, reproduced in Barry Eichengreen (org.), *Monetary Regime Transformations*. London, Edward Elgar Publishing, 1991.

<sup>24</sup> Cf. S. S. Katzenellenbaum. *Russian currency and banking, 1914-1924*. London, P. S. King & Son Ltd, 1925, p.120.

hyperinflation. Interestingly, it was also preceded by an unit of account experiment, the ECU (European Currency Unit), though with no similarity to the Brazilian URV, as explained below

Brazil had changed its currency eight times starting in 1942, as pictured in Table 4, the Real being the result of the eighth reform in 1994.

There are at least three essential features of currency reforms: (i) There must be a parity to the old currency, to undertake conversions and change, or a “change of units”; (ii) There must be a connection with some measure of purchasing power, typically the exchange rate, to ascertain that x units of the new currency are worth the same as y units of the old, being retired at the x/y parity; and lastly (iii) The reform law (defining the new legal tender) may or may not modify contractual clauses of monetary correction, even rules for payments denomination more generally.

With this in mind, and considering mostly the Brazilian experience, Table 4 classifies Brazilian reforms into three basic types:

- (i) Type A – pure change of units, or “cutting zeros”, most commonly, to ease accounting and computer processing, with one single parity, without any change in contracts<sup>25</sup> or in the “production function” of money<sup>26</sup>.
- (ii) Type B – the reform law establishes different rules of conversion, according to the type of money holding or obligation. Parities might be selective according to contract or amount, generally aiming at neutrality at conversion, but facing classic conundrums like prefixed vs postfix obligations, thus the justifications for *tablitas*, *pro-rata* factors, which might be complicated, and the conversion to average real values according to a variety of formulas.
- (iii) Gurley type – Selective but with explicit confiscatory, “liquidity reduction” or “tax collection” (as in 2016 India) purpose.

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<sup>25</sup> Experience seems to show that, when given enough time, contractual relations adopt to the new currency without much need to regulate conversions.

<sup>26</sup> The Euro was introduced smoothly and carefully, to be felt to user as something like a mere change of units. But it was the largest exercise of monetary integration ever done. Its most interesting feature was the newly created European Central Bank to run a supra-national monetary policy at yet unseen levels of “independency”. It was way more than simply currency reform.



Table 4. Monetary reforms, Brazil 1942-2013

Standard	starts	ends	Duration (months)	Inflation (%)			parity at reform	reform type
				acc	monthly avr	annual avr		
1 <b>Cruzeiro</b>	nov/42	jan/67	292	31.191	2,0	26,6	"1/1000"	type A
2 <b>Cruzeiro Novo</b>	fev/67	mai/70	40	90	1,6	21,2	"1/1000"	type A
3 <b>Cruzeiro</b>	jun/70	fev/86	190	206.288	4,1	61,9	"1/1"	type A
4 <b>Cruzado</b>	mar/86	dez/88	35	5.699	12,3	302,3	"1/1000"	type B
5 <b>Cruzado Novo</b>	jan/89	jul/92	15	5.937	31,4	2.558,8	"1/1000"	type B
6 <b>Cruzeiro</b>	mar/90	jul/93	41	118.590	18,8	694,0	"1/1"	Gurley type
7 <b>Cruzeiro Real</b>	ago/93	jun/94	11	2.396	34,0	3.244,1	"1/1000"	type A
8 <b>Real</b>	mar-94	dez/23	353	690	0,6	7,3	"1/2750"	type B

SOURCE: Central Bank of Brazil, author's calculations

Gurley reforms refer to 24 episodes after World War II described in his classic study<sup>27</sup>. Benchmarks are defined as Soviet, Belgian or Germany (the hybrid). The benchmark Soviet reform, reproduced in several Iron Curtain countries, were designed to “reduce the supply of liquid assets at the outset” by “compulsory exchange of old banknotes & old bank deposits at rates of exchange which effectively reduced the outstanding volume of these assets.” Different parities applied according to: (i) type of asset; (ii) amounts; (iii) identity of holder. The benchmark Belgian model was centered on blocking monies or deposits, later to be released, with a variety of haircuts, according to discretionary criteria. The celebrated German 1948 “*miracle*” was a hybrid of URSS and Belgian models, combining multiple parities, frozen assets and haircuts of several types<sup>28</sup>.

Brazil has undertaken eight currency reforms since 1942, including the Real Plan, as per Table 4. The first three (1942, 1967 and 1970) were mere change of units (type A). In sequence, two of the so called “heterodox shocks” (1986 Cruzado Plan and the 1989 Verão Plan (bringing in cruzado novo) had Type B currency reforms not admittedly intended to impinge haircuts or taxation into assets and contracts.

The March 1990 reform, known as The Collor Plan, was a Gurley type reform (bringing cruzeiro again), of a Belgian variety. Note that “old currency”

<sup>27</sup> John Gurley “Excess liquidity and European Monetary Reforms 1944-1952” *American Economic Review* 1953.

<sup>28</sup> For a more contemporaneous and benign view of the post WW2 reforms see R. Dornbush & H. Wolf “Curing a monetary overhang: historical lessons” in G. Calvo *et al.* (orgs) *Money, capital mobility and trade: essays in honor of Robert A. Mundell*. Cambridge, The MIT Press, 2004.

(cruzado novo) remained unconverted (amounts in deposits and investments above some reference value) for approximately two years after the reform as “blocked deposits” (or *cruzados bloqueados*, as designated, the Brazilian equivalent of the Argentine *corralito*), finally released (with interest accrued) in mid-1992. The Brazilian Supreme Court (STF, *Supremo Tribunal Federal*) never actually ruled whether there was a haircut or that an indemnity was due.

Two other “heterodox shocks” implementing price freezes (Bresser Plan in 1987 and Collor 2 Plan in 1992) did not implement currency reforms.

The Real Plan was a Type B reform, adopting much of the monetary transition (contract conversion) technologies developed by the past stabilization attempts. Its key and novel transition feature was the creation of URV (*Unidade Real de Valor*), an official unit of account, technically a money of account or contract currency, defined as such by Law as *part of the monetary system, though not yet an instrument for payments*.

The URV creation was like securing a definition in Law to an imaginary currency<sup>29</sup>: a stable unit of account (in the sense of having stable purchasing power), as it followed a sliding scale with respect to the loss of purchasing power of the existing legal tender, the cruzeiro real. It drew on the rich experience of Brazilian indexed bonds, and of stable units of account used, for example, in taxation, as explained in the next section.

Other Latin American countries have experimented with similar schemes before and after the URV: UF (*Unidade de Fomento*) in 1967 Chile, UVC (*Unidade de Valor Constante*) in 1993 Ecuador, UDI (*Unidad de Inversion*) in Mexico 1995, UPAC (*Unidade de Poder Aquisitivo Constante*) in 1995 Colombia and UR (*Unidad Reajutable*) in 1996 Uruguay<sup>30</sup>.

European experience with regards to diverse competing units of account, or with the separation between functions of money (means of payment and unit of account) is rich and remarkable. The ECU (European Currency Unit), created in 1979, is a case in point<sup>31</sup>. The ECU was a unit of account whose

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<sup>29</sup> In the sense commonly used in the Middle Ages, as described by Luigi Einaudi, *The Theory of Imaginary Money from Charlemagne to the French Revolution*, Palgrave Macmillan Books. ‘Ideal money’, ‘political money’, *moneta numeraria*, ‘money of account’, even ‘ghost money’ are references to popular units of account that, in many cases, no longer existed (like gold marks of yesteryear in the 1920s) and sometimes have never been even coined. It is *imaginary* because it is only an unit of account without a physical existence.

<sup>30</sup> According to Robert Schiller “Indexed units of account: theory and assessment of historical experience” *Cowles Foundation Discussion Paper* n. 1171, February 1998.

<sup>31</sup> As described by Bordo & Schwartz, “a precedent for the separation of unit of account and means of payment is exemplified by the ‘imaginary’ or ‘ghosts’ monies that were known in Europe between the ninth and the eighteenth centuries. Cf. Michael Bordo & Anna Schwartz “The ECU: an Imaginary or Embryonic Form of Money: What Can We Learn from History?” *NBER Working Paper Series* n.2345, August 1987.

variation was given by a basket of currencies; but it did not have a visible quotation as IMF's SDR (Special Drawing Rights) that is also guided by a basket. The ECU was initially created to be the reference to exchange rate intervention under the "snake", bands inside which European currencies should fluctuate. It is a slight exaggeration to say that the euro was "a *continuation* of the old unit [the ECU]" or "the same thing that had simply evolved, with a different name, into a currency. It seemed more like an accommodation of definitions as if the ECU was *transformed* into the euro, as if it was a merely a change of designation, as URV having *its name changed* to real<sup>32</sup>.

The language of the law creating URV revealed one of the major virtues of the Real Plan: a conceptually sophisticated dialogue between Law and Economics. The URV was created as an official unit of account, to serve as *legal tender though exclusively as standard of monetary values, being part of the national monetary system*<sup>33</sup>. It was like recognizing in law the separation of functions of money, as indeed admitted in the rich Brazilian experience in law and jurisprudence with indexation and monetary correction.

The implicit understanding was that money is but a creation of the legal language, and nothing (in the Brazilian Constitution) prevents Congress (the Law) to segregate a currency for payments and another one, or another formula, to perform the indexation clauses, as extensively done in Brazil for many years.

The legal recognition of the loss of purchasing power of money was already well established in Brazil; likewise, jurisprudence of indexation clauses was rich and widely disseminated in the contract realm. Therefore, there was nothing especially revolutionary into the explicit segregation of functions of money.

Further, the same law creating the URV determined that *when issued by the central bank in the form of notes, URVs will become legal tender for payments, will have its name changed to real, and cruzeiros reais will be demonetized*.

No date was initially set for URVs to become real, a full currency, and to cruzeiro real demonetization. The idea was to wait for the URV to disseminate until the next step, as discussed below. After two months, way faster than expected, adoption was advanced enough so that government fixed July 1<sup>st</sup> as the D-Day, the day URVs would be issued as means of payment, under the designation of real, replacing cruzeiros reais *at the parity of that day*.

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<sup>32</sup> In the European case, however, the choice of the name was perhaps the most challenging issue. ECU was an incredible convenient solution as it was the English acronym of European Currency Unit; it was also the name of a French monetary unit minted during the reign of Louis IX of France, in 1266.

<sup>33</sup> Law 8880/1994, article 1.

URVs had their cruzeiro real value changed every day according to inflation, as explained below, with its initial cruzeiro real value set at CR\$ 647,50, the exact exchange rate for one US Dollar into cruzeiros reais, as shown in the appendix. URV operation, and implied preparations for the full monetary replacement, lasted four months at the end of which, at the last day of URVs existence with this designation, the parity between cruzeiros reais and the URV was R\$ 2750,00.

### 3. Changing units is not trivial.

Economists rarely devote much attention to the practicalities of the circulating media, be it the iconographic options, and the logistics (manufacturing and distribution) of paper money, as it could sound like a distraction from *fundamentals*, the true causes of inflation, always deceived by appearances, and so often forgotten by those in charge of stabilization programs. Yet, stabilization is about rebuilding trust, and nothing is more embedded with symbols than money, the subject of stabilization, the universal equivalent, as described by Marx as the “the universal pimp of men and peoples ... between need and object, between life and man's means of life”<sup>34</sup>. The more so in times of currency collapse and reform.

Oftentimes currency collapses take place in the context of the advent of or experimentations with fiduciary money when nothing seems to control fiat currency producers. This is the crucial moment in which inscription and backing (substantial nature related value) are replaced by representation and trust (promises). Convertibility into *true* wealth is turned into vague promises of purchasing power preservation in a context in which the exchange value of fiat currencies is indetermined unless by government intervention, that is by monetary institutions<sup>35</sup>.

There is a long list of financial instability episodes in the context of experimentation of paper money possibilities, bubbles and panics of various sorts. Hyperinflations are modern phenomena, most classic episodes occurring prior to the 20th century produced modest inflations by current standards. But

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<sup>34</sup> Marx, Karl (1844). “Money” – Economic and Philosophical Manuscripts, in: <http://marx.eserver.org/1844-ep.manuscripts/3rd.manuscript/4- money.txt>.

<sup>35</sup> This has been said in many ways. A very technical form of this same wisdom is given by Neil Wallace “Why markets of foreign exchange are different from other markets”. *The Federal Reserve Bank of Minneapolis Quarterly Review*, Fall 1979, or in Preston Miller (org.) *Rational expectations revolution: readings from the frontline*. Cambridge: The MIT Press, 1994, pp.198-199.

it does not follow that in hyperinflations there was no experimentation with the limits to paper money.

Elias Canetti's vivid description of the German hyperinflation process provides a powerful reminder of what is at stake in a high inflation process: "an inflation [like this] could be called a witches' sabbath of devaluation where men and units of their money have the strangest effects on each other. The one stands for the other, men feeling as "bad" as their money; and this becomes worse and worse. Together they are all at its mercy and all feel equally worthless."<sup>36</sup>

The disturbingly large rows of zeros, conspicuously displayed in paper money bills of extravagant denominations, compose one the more complex expression of hyperinflation. Paper money is the visual carrier of those zeros, a multiplier of void, "everybody has a million, and a million is nothing" says Canetti.

Money is a national symbol, like the flag and the anthem, its humiliation, as performed by several zeros inscribed along with portraits of national heroes, is said to be just unbearable. For many historians this forms the root of the connection between hyperinflation in 1923 and Nazi ascent, signaled by their electoral victory in 1933, ten years later. According to Thomas Mann, for instance: "a straight line runs from the madness of the German inflation to the madness of the Third Reich"<sup>37</sup>.

All this to argue that these simple Type A reforms, comprising only changes of units, are more important than they appear. It was a very singular feature of the Brazilian experience that there were no wheelbarrows full of worthless cash, like the iconic German images<sup>38</sup>.

Simply put, had Brazil not effected any change of units, or "cutting zeros", since 1942, the management of nominal values would be just impossible. All reforms considered, the parity between the 1994 currency (the real) and the 1942 cruzeiro would be:

R\$1,00 = Cr\$ 2.750.000.000.000.000.000,00.

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<sup>36</sup> Elias Canetti. *Crowds and Power*. Nova York, Farrar Strauss Giroux, 1984, p.186. The devilish overtones are a classic in histories of origins of paper money, expressed best of all by Goethe in the second part of Faust, published in 1832.

<sup>37</sup> In a 1942 lecture given at Princeton. According to Bernd Widdig, in *Culture and inflation in Weimar Germany*. The University of California Press, 2001, p. 10, "an almost deterministic connection between the experience of inflation and the rise of National Socialism culminating in the twelve years of the Third Reich has often been made".

<sup>38</sup> Instead, the most usual picture of these days of monetary madness in Brazil is of empty grocery carts, as commonly captured in pictures taken inside supermarkets during the price freezes. It was more a distortion of misdirected inflation fighting than an image of inflation itself.

Just imagine how it would be to buy, for example, a Big Mac sandwich in 1994, worth approximately 5 dollars or R\$ 4,50. In bills of Cr\$ 100,00 – like those with the face of Dom Pedro II, the emperor during most of the Nineteenth century, that sandwich would require 27.500.000.000.000.000 bills. It would not fit into a wheelbarrow; it would take, instead, something like a fleet of container carrier trucks.

Of course, the practical problem could be solved by bills with obscenely large denominations. Zimbabwe *one hundred trillion* bills has become a collectors' item, a numismatic treat<sup>39</sup>, but possibly not even enough to be practical in Brazil absent changes of units: it would take more than one hundred thousand one hundred trillion bills to buy a R\$ 5,00 Big Mac with 1942 cruzeiros in 1994.



Figure 1: One Hundred Trillion Zimbabwe Dollars

The bitter and somewhat paradoxical truth is that the more zeros are there in the bill, the less this currency is worth. For this very reason, issuing a one million denomination bill should be considered a shame everywhere it happens; Brazil barely escaped issuing a one million bill, thanks to the 1993 reform, introducing cruzeiro real in August 1993: the largest bill in circulation (500.000 cruzeiros, 1990 vintage, the “Mario de Andrade note”) was about to fall below values low enough to trigger preparations for a higher denomination bill. These bills were stamped, as shown below, under the August 1993 reform bringing the cruzeiro real: Cr\$500,000.00 would become CR\$ 500.00, the bill *losing* three zeros. No Mario de Andrade bill was issued with the CR\$500.00 inscription, that is, with the denomination 500 cruzeiros reais. In October 1993, instead, the Central Bank introduced a CR\$1,000.00 bill, the last with a portrait of a distinguished historical figure, educator Anísio Teixeira<sup>40</sup>.

<sup>39</sup> This was the largest denomination bill, *circa* 2008, of the Zimbabwe Dollar. In February 2009 a currency reform created the fourth version of the Zimbabwe Dollar, in which the parity was a trillion to one.

<sup>40</sup> After that, bills used regional types, the “*gaúcho*” for a CR\$ 5,000.00 bill, the “*baiana*” for the CR\$ 50,000.00 note, the last issues before the real plan’s reform. It was like there was no more national heroes to humiliate on a new bill bound to be reduced to nothingness in a few months.



Figure 2. Bills under cruzeiro real in 1993.

Indeed, Brazil never issued a one million bill. But it is no less of a shame to issue five different one thousand bills in five different standards in sequence, as shown in Figure 3 below.

Brazil's discoverer, Portuguese explorer-navigator Pedro Alvares Cabral appears on the one thousand note of the 1942 cruzeiro, that has become a single cruzeiro novo in 1967, with Cabral being stamped with the circular reminder the bills had lost three zeros. Under the 1970 cruzeiro, a new designation of the 1967 cruzeiro novo, a one thousand bill carried diplomat Barão do Rio Branco was issued first in 1981. Under the 1986 cruzado the one thousand bill exhibited writer Machado de Assis, shown in Figure 3 with the triangular stamp applied in 1989 with the introduction of the cruzado novo. In sequence, there was no one thousand bill under cruzado novo, converted into cruzeiro at a 1:1 parity in 1990. The one thousand bill under 1990 cruzeiro in Figure 3 shows explorer Marechal Candido Rondon. Lastly, cruzeiro real replaced 1990's cruzeiros at a 1:1000 parity, and shortly later a one thousand bill of the cruzeiro real standard brought educator Anísio Teixeira, as per Figure 2.










Standard		starts	ends	1000 bill
1	Cruzeiro	nov/42	jan/67	
2	Cruzeiro Novo	fev/67	mai/70	
3	Cruzeiro	jun/70	fev/86	
4	Cruzado	mar/86	dez/88	
5	Cruzado Novo	jan/89	jul/92	
6	Cruzeiro	mar/90	jul/93	
7	Cruzeiro Real	ago/93	jun/94	

Figure 3. One Thousand Bills under five different standards since 1942.

At what price Brazil avoided the ridicule of a one Million bill? What could be less ridiculous than printing five consecutive one thousand bills, five rows of three zeros, precisely one thousand trillion, ten times the famous Zimbabwe note pictured in Figure 1?

All this serves the noble purpose of delivering a hyperinflation diagnosis.

#### 4. The 1994 monetary reform

Brazil's solution to currency reform under the Real Plan had several novel features, starting with the URV mechanism, on top of several ingenious formulas used in the past, in Brazil and abroad. Currency reform, as suggested in section 2, was not exactly a new topic. Especially in Brazil. Several lessons had been learnt with the previous reforms shown in Table 4, and with failed heterodox shocks.



One initial and crucial difference separating the Real Plan from past inflation fighting initiatives was its non-coercive character, a deliberate variance with respect to previous stabilization attempts in Brazil. This has become the first core principle of the new plan and one that Finance Minister Fernando Henrique Cardoso particularly enjoyed voicing. Everything should be voluntary, with adherence to the plan, that is, adoption of the new unit of account and its contractual protocols being determined mostly by individual choices.

As a matter of fact, not everything could be voluntary as announced, as some of the most sensitive issues in stabilization plans with currency reforms, like transition rules for wages and pensions, for instance, as also for rents and tuitions, would depend on law, namely on heavy political negotiation. Minister Cardoso also liked that part: the program was incentive based and duly discussed and approved in Congress.

Violence had escalated through heterodox shocks, most notably from the hugely popular 1986 Cruzado Plan to the somber stupor provoked by the asset freeze in 1990, Brazil's sole experience with a Gurley type currency reform. Political tensions rose in proportion to the ineffectiveness of these efforts; no doubt the ill-fated 1990 monetary reform was relevant to President Collor's impeachment in 1992.

Violence was indeed a readily available response to what politicians saw as a crime, in line with old legislation, dating from the Vargas' years, on market excesses, usury, and price controls. "Crimes against the people's economy are equivalent to crimes against the state", said (on a literal translation) the 1937 Brazilian Constitution<sup>41</sup>, the one made by Vargas to regulate the Fascist Government to last until 1945.

It was only intuitive for politicians that they could put an end to inflation in a simple way: *forbid* citizens to raise their prices, as if lawmakers could *make inflation illegal*.

The price freeze was the ultimate attack on the market system, also the prime illusion about politicians' ability to mobilize law enforcement to stop inflation. Old laws on price controls and on "abusive" profits, interest rates or price changes, were typical of the totalitarian regimes of the 1930s, left and right, were still in force. Destined to oblivion, obsolete, but not dead. Worse, the spirit of this legislation was in tandem with many anti-market politicians in the 1980s and 1990s, left and right, riding the anger produced by hyperinflation. Further,

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<sup>41</sup> Franco, *A moeda e a lei ... op. cit.* p.407.

it is unfortunate that these old spirits contaminated the conversation about indexation.

De-indexation very easily became a second derivative of the price freeze. Banning indexation out of contracts had become part and parcel of heterodox shocks. Let there be no mistake: purging indexation from monetary stipulations would be equivalent to force the population into money illusion. The prohibition of indexation, or of inflation protection schemes, imposed upon a population living under high inflation for several decades, as professed by some heterodox high priests, was simply an insanity. Very much like *prohibiting* price increases.

So often Politicians conceived stabilization not as *policy* problem, but a *police* business: call the police to arrest supermarket managers, or banks' tellers on the spot, loudly in front of cameras, *media* events much to the liking to the populist, invoking fascist legislation against the working of markets.

The exhaustion of these possibilities was very clear in 1993, when Cardoso started as Finance Minister; the challenge was of designing a stabilization mechanism citizens would support and comply not based on coercion and obsolete legislation, but as Adam Smith's bakers and butchers, based on their own free will and best interests, an incentive compatible stabilization plan. Stabilization and monetary reform as mechanism design.

A second key premise to the new plan was that the reconstruction of money should proceed as a reverse engineering the way inflation destroyed the currency, that is, according to the functions of money, possibly in sequence, but starting with the unit of account where things were the most confused.

As a general and accepted description of inflation, though somewhat idealized, the store of value function of money is the first that is lost, as other things or currencies better retain and protect purchasing power. Next, the national money loses the unit of account function as economic calculation goes in search of stable standards, indices, and scales, and indexation systems adopted according to one's business network practices. Lastly, the final act of money's demise, that Brazil never actually reached, was to see the national money losing the means of payment property, when better means of payment (with legal tender) inflate away the inferior currency.

Brazil's financial system had developed good money substitutes to store wealth. Inflation protected bonds issued by the Government were hugely popular and

accessible thanks to the dissemination of mutual funds to offer divisibility. The “monetary aspect” of these bonds was a common discussion topic in banking circles at the time, as parts of M3 or M4, the “Monetary aggregate” to be controlled by the monetary authority. No wonder the theme of indexed monies was so heavily debated in the mid-1980s in Brazil.

As for the means of payment, or technology of payments function of money, the Brazilian inflation offered an interesting experience: since payments leads and lags could be just mortal in a hyperinflation environment, and revenues associated with “the float” had become so central, the banking system invested heavily in the agility and efficiency of payments. Years later, coming digitalization, Brasil would be at the forefront of innovation in payments practices. Necessity is the mother of invention.

As it seemed, late in 1993, the reconstruction of money did not have very essential problems in connection with stores of values and with the payments system. The big issue appeared to be connected to the unit of account. The URV mission was to organize, centralize, or to reorder the myriad of indexation systems and spheres. The unification of scales was just essential.

The diversity of indexation systems was determined not only by individual index choices, and there were dozens of indices flooding newspapers’ financial pages, but also by habits and arrangements as to frequency and timing of price readjustments. This diversity easily produces unmanageable relative price dispersion.

At any point of time, say, under a 30% per month inflation and a high diversity of indexation methods, an interruption of inflation would work like an instantaneous picture catching prices and wages at peaks or valleys, thus revealing incredibly large misalignments in relative prices, huge headaches to policy makers, and inflationary pressures overflowing the new currency.

Two examples.

Example 1: the Brazilian national wage policy in force at the end of 1993<sup>42</sup> comprised the division of all workers into four groups according to the union they belonged. Each group had the right of a quarterly wage readjustments corresponding to the full CPI inflation at the quarter, but with *advancements* every month. In this system, in March, when group A gets full recomposition of their

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<sup>42</sup> Law 8700/1993. It created the obligation that all wages in the country be readjusted monthly. Each month the readjustment would be given by the variation of the index in excess of 10%, this lag being compensated at the fourth month of the readjustment cycle.

real wage (minus advancements), group D was in its worst moment in terms of purchasing power, prior to full recomposition of peak levels in July.

Example 2: federal civil servants of the executive branch were paid the last day of the month. Those of the Legislative and Judiciary branches, however, received their dues on the 20<sup>th</sup>, that is, 10 days before. Many careers in these branches of government are identical and should have equal pay. But in practice, those paid at the 20<sup>th</sup> are paid more, or *better*.

These are examples of differences in compensation that should not exist, but high inflation made them chronic. A sudden stop of inflation would crystallize such distortions, if not *manually* corrected.

In all type B currency reforms reported in Table 4 there has been attempts to correct such problems. Oftentimes, however, *ad hoc* corrections made things worse, as in many situations with the so called *tablitas*.

These distortions were pervasive in a high inflation environment. It was everyone's effort to match indices and synchronize readjustment frequency with clients and contractors, backwards and forwards, thus creating small currency areas, or zones of influence of certain units of account and indexation practices.

Past experience suggested strongly that every effort should be made to get (relative, or real) prices and wages right at the onset of currency reform, or to seek some overall unification of indexations or else the new currency would be born under heavy pressure.

It was a popular belief that *deindexation* could be the solution to these distortions, but nothing could be further to the truth. In fact, the best course of action was to go exactly the opposite direction, that is, *perfecting* indexation. Moreover, past failures in attempted *deindexation* made things worse, mobilizing lobbyists and courts to discuss price misalignments caused by currency reform laws and indemnities thereto. How should *deindexation* work in this poisonous atmosphere?

The Real Plan introduced a new system to get by these issues, an official unit of account, called URV (*Unidade Real de Valor*) to which all could/should adhere, this meaning converting their monetary stipulations into this new denomination.

There was great advantage if all agents in the economy were under the same indexation system, that is, under the same unit of account and timing of

readjustments. Yes, indexation is partly monetary reform, or a big part of a new currency, as it is about the unit of account function of the national currency. It is no accident that indexation is also called, perhaps more appropriately, monetary correction<sup>43</sup>. Indexation is a monetary phenomenon, having to do with money's unit of account function.

Coordination of readjustments, as regards frequency, timing and choice of index is a great asset to stabilization. It is the flipside of this *first half* of currency reform. Price and wage coordination around the same indexation system happens spontaneously in economies subject to extensive indexing with respect to the exchange rate, a process sometimes referred to as *dollarization*.

There are many meanings to dollarization. The concept normally refers broadly to the abandonment of the national currency and adoption of a foreign currency (commonly the Dollar) as the national money. Adopting the gold standard, for instance, would be very close, if not identical to what is normally designated as dollarization in recent times, but with reference to gold.

There is also some other language for similar phenomena like currency substitution, and euroization, as reported in certain countries<sup>44</sup>. Dollarization has become a common description of the 1991 Argentine convertibility plan, but also Ecuador's 2000 monetary reform, despite their differences<sup>45</sup>.

Most commonly, dollarization may be capital flight seeking Dollar (or strong currency) denominated assets or price and wage indexation with regards to the exchange rate to the Dollar (or other strong currency). Or both. The first is related to the national currency loss of the store of value function, the second to the degradation of the unit of account function of the national currency.

Not only there are different degrees to this process, according to the (normally self-inflicted) degradation of the national money, but it happens at different paces in financial markets, payments' practices, and contract technologies.

The use of the Dollar, or of the exchange rate to a strong currency, as a standard of value, or unit of account, is normally the way the process starts. In a high inflation environment, the population seeks scales with which to perform

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<sup>43</sup> Milton Friedman was a famous user of this language, as in "Monetary correction: a Proposal for escalator clauses to reduce the costs of ending inflation". *Institute of Economic Affairs Occasional Paper*, no. 41, 1974.

<sup>44</sup> See E. Feige & J. Dean, 2004, "Dollarization and euroization in transition countries: currency substitution, asset substitution, network externalities and irreversibility," in V. Alexander *et al.* (orgs) *Monetary Union and hard pegs: effects on trade financial development and stability*, New York and Oxford, Oxford University Press.

<sup>45</sup> The Argentine plan was of a national currency (peso) convertible into dollars at a fixed rate, as in an arrangement known as currency board. In Ecuador, the national currency (sucre) was abolished, and the Dollar acquired legal tender status.

economic calculations, to determine what is expensive or cheap, that is, to recover the *visibility* of the price system.

In many countries, the adoption of indexation with respect to the exchange rate in pricing, wage-setting and contracts more generally was smooth and natural, mostly countries fitting the textbook definition of “small open economy”. It was very common in Interwar Europe in anticipation to a return to the gold standard and in Latin America in the 1980s and 1990s. Some countries, like Brazil, made efforts to restrict dollarization. Others just accepted it, depending on national conditions<sup>46</sup>.

The nature and extent of dollarization in Latin America varies a lot. In the financial system, for instance, the share of local deposits denominated in foreign currency in 2001 varies from 91,4% in Bolivia, 79,6% in Argentina, and 92,5% in Uruguay to 0,3% in Colombia, zero in Brazil, and 8,1% in Mexico<sup>47</sup>.

Brazil fought the dollarization trend since the 1970s and introduced every obstacle to indexation with the exchange rate. In Brazil, the basic definitions as to the legal standing of indexation clauses (monetary correction) established in 1969<sup>48</sup>, directly restricted dollarization. According to law, indexation to the exchange rate, and the stipulation of values denominated in foreign currencies, even when referring to payments in the national currency according to the exchange rate of the day, are restricted to transactions in which one party is a non-resident. The concept was that dollarization, in the sense of Dollar denomination or indexation, was for *international* transactions only.

Brazil may have enjoyed advantages from this stance in several grounds (for instance, preventing the offshoring of financial wealth or the national savings), not to be discussed here, but one possibility lost was the smooth transmission into prices of the fixing of the exchange rate so commonly seen of countries returning to the gold standard in the 1920s: typically, all prices, wages and economic calculation was effected with reference to gold, or prewar units of a currency with suspended convertibility (gold marks, or other imaginary currencies, for instance), so that there was very little (comparatively) relative price dispersion and the fixing of the exchange rate would terminate inflation overnight.

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<sup>46</sup> For a discussion see G. H. B. Franco “Dolarização: mecanismos mágicas e fundamentos” Departamento de Economia PUC-Rio, *Texto para Discussão* n. 266, August 1991. Reproduced in *O Plano Real e outros ensaios*. Rio de Janeiro, Francisco Alves Editora, 1995, ch.5.

<sup>47</sup> According to an IMF report: *Stabilization and Reform in Latin America: A Macroeconomic Perspective on the Experience Since the Early 1990s*, A. Singh *et al.*, Washington, 2005, chapter VI, Table 6.2.

<sup>48</sup> Decreto-Lei 857/1969. Cf. Franco, *A moeda e a lei*, *op. cit.* p.110.

How could Brazil have access to this mechanism, being a relatively closed economy, a continental sized country with all sorts of obstacles to indexing with respect to the exchange rate, many indexation systems in place, with 30% per month inflation and convinced that stabilization through a ride along the Phillips' Curve was impossible?

The answer was the URV. An indirect or a *proxy* for dollarization.

#### 4.1. URV's design

The construction of a *stable* unit of account to be lawfully and wishfully adopted in all contracts would be such as to be perceived as a *superior* indexation system, or a *better* unit of account into which to denominate a contract, independent of how payment is to be made. It was only natural to expect that Gresham's Law would also work for moneys of account<sup>49</sup>, so that if a better method to protect purchasing power is available, incentives would point to its adoption. Once adopted, the plan would be to take advantage of the price & wage coordination thus accomplished.

How to construct such unit of account, and use its coordination powers or network effects, without plunging into dollarization? How to engineer a *domestic* dollarization?

The URV was the attempt to answer that. Its architecture starts with the notion that the URV was *not* indexed to the Dollar, it was the other way around, as explained in the diagram in Figure 1, as follows.

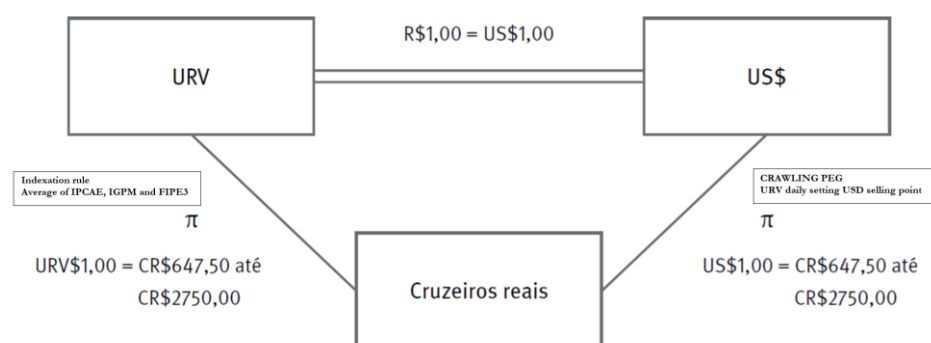


Figure 1. URV mechanism

<sup>49</sup> A reference to this link can be found in P. E. Guidotti & C. A. Rodrigues "Dollarization in Latin America: Gresham's Law in Reverse?" *IMF Staff Papers*. vol.39 n.3, Sep 1992.

The diagram (Figure 1) shows the dynamics of URV as a triangle.

On the left side, connecting URV to cruzeiros reais, there is the URV indexation rule, defined by a presidential decree<sup>50</sup>, involving the three very popular price indices as described below.

On the right side, the connection between cruzeiros reais and the exchange rate was given by the crawling peg rule adopted by the Central Bank. A resolution of the National Monetary Council<sup>51</sup> established that BCB would sell dollars against cruzeiros reais every day at a maximum rate equal to the cruzeiro real value of the URV. The exchange rate (as managed by the BCB) would follow inflation, not the other way.

There seems to be no mystery that the URV would have a “stable value” with respect to the Dollar as seen in Figure 1. At least, while cruzeiros reais are in existence. The third side of the triangle becomes *Pythagoreanly* determined by the other two, there following that the URV was seen as something like one Dollar. It was not exactly dollarization, but a *proxy*, or a *synthetic (domestic) dollarization*, very much like the German *rentenmark* mechanism, but the public’s perception was that there was a correspondence between URVs and the Dollar.

The URV was a *stable* unit of account, with respect to the cruzeiro real, the sole legal tender, because it was indexed to three very popular price indices (IGPM, IPCA-E and FIPE-3) measuring inflation in cruzeiros reais, all three published by independent institutes of impeccable reputation, each with its specific areas of influence (respectively, real estate related transactions, the tax system and the city of São Paulo).

A *stable* unit such as the URV was not entirely novel to Brazilians. The most familiar precedents at the time were inflation protected bonds and tax units. Amongst the former, the ORTNs (*Obrigações Reajustáveis do Tesouro Nacional*, Federal debt instruments with nominal values) were meant to be the official unit of account in 1977, an experience that lasted several years.

More recently, and closer in design to the URV, was the UFIR (*Unidade Fiscal de Referência*), widely employed by the federal tax system (with several modified versions in use in states and municipalities across the country).

UFIR had a daily expression (UFIR *diária*, as it was known), and for URV also to have the same feature, the UFIR mechanics was a very safe precedent. UFIR was readjusted every day according to “expectations” as to reference inflation

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<sup>50</sup> Decreto n.1066/1994.

<sup>51</sup> Resolução CMN n. 2053/1994.



index (IPCAE, today IPCA15, calculated and published by IBGE, *Instituto Brasileiro de Geografia e Estatística*) variation at the end of the month. Necessarily, though, UFIR's money expression at the end of every month should be identical to the entire and exact variation of the reference index (IPCAE) of the same month. The intramonth changes, or the daily changes, were just discretionary.

Given that the calculation of inflation according to any give price index is not instantaneous, as it involves extensive collection of many types of prices across the country, some explaining is in order as to understand this UFIR mechanics, or more specifically how to produce an index to be published at the last day of the month with this month's inflation?

Indeed, IPCAE (today's IPCA15) is a price index that shows inflation for any given month at the last day of the month. How exactly this is done?

The answer is by collecting prices up to the 15<sup>th</sup> day of the month. A July inflation, say, would be given by the comparison of average prices observed between June 15<sup>th</sup> and July 15<sup>th</sup> with average prices computed between May 15<sup>th</sup> and June 15<sup>th</sup>. With that, there is a lag between the collection and the month of accrual, but many years of experience had shown this to be of a lesser importance. And with this system, IBGE could publish every month's inflation as measured this way, at the last day of the month.

Only those that lived through high inflation can appreciate how important it is to have the month's inflation at the last day of the month<sup>52</sup>. This was the precise reason IGPM produced by FGV with this requirement has become the most used index in rents and real estate related transactions. IGPM collects prices like IPCAE but up to the 20<sup>th</sup> of the month.

IBGE and other prices' collection institutes normally also publish versions of their index without these lags in price collection. IBGE publishes IPCAE and ordinary IPCA, with price collection ending on the last day of the month and publication of the index, or of the month's inflation, one or two weeks after the end of the month. The same goes for FGV (*Fundação Getúlio Vargas*), that published their flagship indices IGPM (with collection until the 20<sup>th</sup> of the month) and IGPDI (with collection until the last day of the month). The popularity of the indices with lagged collection was proportional to the

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<sup>52</sup> This might not be important at all in countries with widespread dollarization, *i. e.*, indexation with respect to the daily exchange rate. But that was not the case of Brazil.

inconvenience of working with indices that are announced sometime after the end of the month.

A third index was used in the URV basket, the oldest of all, calculated and published since 1939 by FIPE-USP (*Fundação Instituto de Pesquisas Econômicas da Universidade de São Paulo*) and measuring on a weekly basis the cost of living in the city of São Paulo<sup>53</sup>.

Ultimately the formula defining the URV indexation used three indices known to have the same property of being able to have the month's inflation published at the last day of the month. By construction, therefore, it was simple to adopt the UFIR mechanics for URV's daily variation. Averaging the differences or providing a rationale for the combination of these indices could be a problem, but the advantages of moving into daily indexation according to an economy wide index seemed just great.

It was easy to calculate URVs retroactively, once one fixed the cruzeiro real value of the URV at its first day of existence, July 1<sup>st</sup>.

This value was set at exact CR\$ 647.50 which by no coincidence was the exact selling point for Dollars against cruzeiros reais at that day. Using the historical data series for the three indices the law provided in its annex the daily cruzeiro real value of the URV for each day of the previous 12 months. With this annex anyone could look into any past amounts received in cruzeiros reais at any day and compute how many URV this corresponded to. Just like computing the Dollar value of amounts received in the past at the exchange rate of the day.

In the Appendix to this essay, in tables A.1 (a) and (b) one can see the URV daily values in cruzeiros reais in each day from January 1<sup>st</sup>, 1993 (CR\$ 13.01) until February 28<sup>th</sup> (CR\$ 637.64). The law creating URV, dated February 28<sup>th</sup>, 1994, fixed its value on March 1<sup>st</sup>, 1994, at CR\$ 647.50 and brought these values in its annex.

Table A.1 (c) shows the cruzeiro real value of URVs at each day of the period URV were "alive", that is, for March to the end of June 1994. Table A.1 (c) also shows the exchange rate at which the Central Bank intervened in FX markets during these four months. Most usually it was on the buy side, so that it is a cruzeiro real value somewhat lower than the URV value, which was the sell side intervention point to BCB. International reserves increased by some US\$ 6.0 Billion from the end of February to the end of June.

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<sup>53</sup> In this system, any 4 weeks measured in sequence, could signal a monthly rate, on a rolling basis. The reading for the third week (thus known as FIPE3) would be the most similar to IPCAE and IGPM.

The numbers for URV reference values at each day since January 1993 would be essential in calculations as to average real wages, for example, transforming cruzeiros reais received in URV by the daily quotation at the payday, for then to take averages in the context of conversions, not only in labor contracts, but in pensions, rents, school tuitions and loans, all with specific instructions defined in law.

Admittedly, not all contract conversions into the new unit of account (currency) would take place on a voluntary basis. Many issues should be regulated by law and carefully negotiated with Congress. In fact, all themes in which there existed a specific law fixing rules of indexation, normally defining the index and the frequency of readjustments, had to be adopted by the law introducing the new currency.

Unsurprisingly, these themes were the most sensitive ones: wages, pensions, rents, school tuition, among others. There were specific indexation rules for each such issues and transition rules would have to be set for each situation. These rules could be unfriendly and even hostile, as in the cases of the Gurley reforms. Or could be overly populist formulas, as famously practiced in the 1986 reform introducing the cruzado, that would probably ruin the effort. Good transitions rules should seek neutrality.

For all these themes the Real Plan could rely on and emulate formulae successfully implemented in past stabilization plans, as well as apply the lessons learned from failed methodologies. The rich experience on currency reforms, as illustrated in Table 4, despite mostly composed of failed stabilization attempts, brought many innovations, along with many practical lessons to the design of the solutions introduced by the Real Plan.

By far the most sensitive issue in the transition was the national wage policy, roughly described above, with reference to “example 1” of policy induced relative prices misalignments. Wages got readjusted to the full variation of inflation every quarter, but got also partial readjustments every month, as advancements<sup>54</sup>.

The transition formulas used in the past for wages and more generally into all types of contracts employed the concept of “conversion to the mean real value computed along the full readjustment cycle”. That was essentially averaging

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<sup>54</sup> Workers were divided in four groups, to have their full real wage recomposition at the end of each quarter: Group A in March, Group B at July, Group C at September, and Group D in December.

peaks and valleys of purchasing power, under the assumption that all parts were fully aware of the effects of inflation on their relationship.

When the mechanism was first introduced in 1986 there was some discussion on its merits, some argument that the peak values were the legally valid ones, but the practicalities of the high inflation environment pointed otherwise<sup>55</sup>. The mechanism was employed seamlessly in other stabilization attempts<sup>56</sup>, notwithstanding complaints from some of the more aggressive unions.

In February 1994 the conversion of cruzeiros reais wages into URV wages was seen very positively by unions for at least two reasons: (i) it was seen as a movement of acceleration of indexation towards the full and unrestricted monthly indexation; and (ii) the averaging using the URV equivalent of cruzeiros reais values paid at the date of payment would eliminate distortions caused by lags and leads in the day of payment, as illustrated above in example 2 of price misalignments caused by high inflation. It was seen as having wages now denominated in Dollars. No doubt, it was seen as an advantageous change of wage indexation rule pending, of course, what will happen to inflation onwards and what guaranties there would be against future inflation.

At the moment of conversion, the law established new indexation rules to wages, and all other sensitive themes subject to law. Of course, there was a concern on developments if the plan failed, on the part of unions as well as from Congress), and the question was simple: what protection (indexation) wages (and pensions, rents and tuitions, etc.) would enjoy from inflation in the new currency?

The currency reform law rewrote indexation laws to secure the right of readjustment (of wages, pensions, rents and contracts in general) according to new inflation, or to the loss of purchasing power of the new currency. It was a simple solution, also practiced in the past, but there was nothing simple about its practical implementation. The technical intricacies in the calculation of price indices, especially when comparing prices in different currencies, or with solutions for statistical carry-over effects, led to disputes, normally avoided by simply asking IBGE to start a new index. The Real Plan law ordered IBGE to

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<sup>55</sup> The peak level would only make sense because there was a known period of low or zero readjustments reducing the real value of the obligation. Peaks and valleys simply had to be averaged, as they part of the calculation.

<sup>56</sup> Plans that failed for reasons other than the concept of conversion by the mean.

create IPCR<sup>57</sup>, and also defined a protocol for the calculations involving prices collected in different currencies<sup>58</sup>.

The monetary reform law established that all wages should have the right to a readjustment according to inflation in the new currency, as measured by IPCR, on their annual regular date<sup>59</sup>. But that was for the first year only. New rules may or may not come to regulate indexation after that, and it so happened that in July 1995, a new law did *not* establish automatic indexation and referred the topic of wage setting to “free negotiation”<sup>60</sup>. That was important, but feasible only because inflation was low, for Brazilian standards, and falling.

In July 1995, IPCR showed a 35,29% variation in 12 months, the first full year of the new currency. IPCA printed 33,03%. For the 12 months from June 1995 to June 1996, IPCR read 13,72% while IPCA showed 16,26%. Differences were hardly material; IPCR was discontinued in July 1996.

Coming back to 1994, and to URV design, the crucial question at the moment URV was introduced was to assess the extent to which this *synthetic dollarization* may produce a coordinated movement of prices and wages at the time URV would turn itself into a full currency and start being traded and quoted with respect to the Dollar. Could this proxy indirect dollarization work the same way as “regular” dollarization in transmitting stability in the exchange rates into prices?

It is not difficult to understand the why URVs, or (*rentenmarks*), had stable value while cruzeiros reais (*reischmarks*) existed. But what happens when the legacy currency is decommissioned? Would the direction of causality between the Dollar and inflation revert?

What would secure value to the new currency?

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<sup>57</sup> IPCR was nearly identical to IPCA with the difference that it refers to families with incomes up to eight times the minimum wage. IPCA considered families with incomes up to forty times the minimum wage.

<sup>58</sup> More detail on this topic, and the controversies around it can be found in Franco, *The real and the exchange rate ... op. cit.* section 2, the measurement of real exchange rates.

<sup>59</sup> Every worker in Brazil is classified into a “category” or workers, though not necessarily a member of the union to that category. Every category has one month of the year when collective bargaining takes place. This is the annual regular date for wage readjustment to a worker, regardless of union membership. Union additional perks obtained in their bargaining will be on top what the law secures.

<sup>60</sup> For a detailed explanation in the context of Brazilian labor laws see P. Paiva “A extração do ovo da serpente no Plano Real”. Belo Horizonte, Fundação Dom Cabral, 2024.

## 4.2. The day after

The conventional answers to these questions would normally be based on arrangements or to properties of the new currency as backing and convertibility. Of course, on a more general level, the determinants of value of *fiat* currencies may be very complex.

On D-day, when cruzeiros reais ceased to exist, and URV had its name changed to real and issued in notes useable to make payments, the Central Bank of Brazil simply withdrew from foreign exchange markets and just let the new currency float.

There was no instruction or guidance, no movement, or words from traders at the Central Bank desk. Total silence and no explanation. There was some expectation that the Central Bank would proceed with the crawling peg routine, thus keep buying excess Dollars every day, as it has been done for some time. Since December 1992, the monthly purchase of dollars was slightly over one billion on average: international reserves rose from US\$ 23,7 billion in December 1992 to US\$ 42,9 billion in June 1994.

The Central Bank repeatedly talked about a capital surge in these few years before the Real Plan and even introduced restrictions to capital inflows, mostly through a tax on certain types of inflows, in contrast to then popular “quarantine” provisions (minimum stay or tenor for short term loans, for instance)<sup>61</sup>. This was a major departure from past exchange control practices and apparatus, built and developed through the years to prevent hard currency from leaving the country. It was totally new to use exchange control instruments, normally geared at financial repression, to prevent excessive entries. The very notion of *excessive* inflows was alien to the established exchange control culture; the *excess* being related to the fiscal cost of acquiring international reserves.

At the level of the trading floor, it seemed just technical that withdrawing from intervening and removing restrictions to inflows would simply allow excess dollars to appreciate the exchange rate.

Would it be useful for the program? Would it be sustainable? At what time frame?

There was some expectation that the Central Bank would enter the market at D-day, at the end of the day, to enforce a 1 to 1 correspondence of the real

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<sup>61</sup> For details and a discussion see Franco, *A moeda e a lei ... op. cit.* p.269, *passim*.

(formerly the URV) and the Dollar, by mere continuation of the procedure repeated every day during the existence of the URV with this designation. Some even expected a hard ‘one to one’ peg to be enforced for a prolonged period, and even an initial devaluation to build up some space to sustain a hard peg for a few years. Yet, none of this was written anywhere.

Alas, not many traders saw the obvious, the excess Dollars and potential appreciation and how useful that could be to the stabilization effort. Without any prior hint, the Central Bank left the market, and the excess supply of Dollars led to the real appreciation; this turned out to be way better for the stabilization than fixing the exchange rate. Of course, it begged questions for the next steps, but let us not lose sight of the fact that this fundamental opening move was very good for the plan and with the added advantage that it carried no commitments to the future – as the Currency Board would entail – not even to the continuation of a clean float.

Floating the new currency on July 1<sup>st</sup>, when the indexation scheme providing the *stable value* property to the URV was extinct, would necessarily be a major test to the new currency. The real will be alone in the stage. Perceptions as to its future developments would govern the exchange rate to the Dollar. Lots of actions were going on in the field of *fundamentals*, fiscal accounts, and reforms. The new currency would be a *better* currency. Would it be enough to build confidence in the new currency? Would it be understood and be considered a “regime change”? Would it be enough for the moment?

The fact was that the real appreciated, and it was an honest float, a market outcome, a result that reinforced confidence in the plan. It was hard to design a better start. Of course, the true “magic” was to produce appreciation at this crucial first moments, and let it be clear, there was no magic to it.

It is hard to ascertain exactly what was the exact winning combination of measures and signals that produced the plan’s credibility, as demonstrated by the new currency appreciation. Of course, plan makers did not know *ex ante*, so that worked on many fronts. Based on repercussions and debates through these days what follows is not much than an impression on factors that seemed crucial, and others that appeared not to have affected the outcome.

Among the apparently ineffective, three factors should be mentioned: (i) quarterly limits to monetary base growth from July 1994 to March 1995; (ii) earmarking of international reserves to serve as (theoretical) backing to the new currency; and (iii) the concept of a monetary programming to be submitted and approved by Congress.

Careful econometric estimates for money demand were produced at the Central Bank research units to allow the National Monetary Council to set maximum numbers for the money base for the first three quarters after July 1<sup>st</sup>. The exact size of remonetization resulting from lower inflation was not easy to estimate.

A 20% additional growth could be granted to the Central Bank upon justifications, and after March 1995, these dynamics would proceed with a proposed monetary programming submitted to Congress. Controlling monetary aggregates was still in vogue in these days, although not as authoritative as it had been in the heyday of monetarism. The homage to that wisdom could be somewhat overdue at this juncture, perhaps, but it may have some impact, certainly on the right direction.

The same instrument (*Resolução CMN 2082/1994*) creating this system also determined the earmarking of international reserves (*lastreamento*), *i. e.* to set aside international reserves equivalent to 100% of the money base. In July this would “consume” 15% of reserves, but in December 1994, after remonetization, it had reached 44%. Not that the real was convertible, as in a currency board, but it would be good to show it could have been. Would it really?

As it seemed, limits of money issuance and convertibility rates were solemnly ignored, resulted just unimportant and were discretely revoked.

On the other direction, if it is to list the factors that really counted in these days, it would be: (i) sustain expectation of reforms and work on *fundamentals* (ii) showing BCB independence, or the new governance of money in practice, (iii) very high interest rate, under the “whatever it takes” concept; (iv) surprise; (v) elimination of inflation inertia with the demise of cruzeiros reais; (vi) the concrete chance to elect the President in October elections.

To this list we can also add two technical factors more directly associated with FX markets: (i) the capital surge mentioned above, producing excess Dollars to the tune of a billion per month in the previous two years before July 1994; and (ii) the fact that deregulation in FX markets has led the parallel (black) market to exhibit a yet unseen *discount* with respect to the official market. This was also a surprising market outcome; January 1994 was the first time a discount was observed in the parallel (black) market<sup>62</sup>.

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<sup>62</sup> Market forces could work better after several waves of deregulation and abolition of exchange controls. *Cf.* Emilio Garofalo Filho. *Câmbio, Ouro e Dívida externa: de Figueiredo a FHC*. São Paulo BM&F e Editora Saraiva, 2022, p.402.



The impact of the exchange rate appreciation was huge. It is hard to assess the relative importance of each one of these influences and their precise timing. But there should be little doubt that they were all relevant to the behavior of the exchange rate in the crucial second semester of 1994. Everyone had an opinion on the exchange rate, and on the new plan, economists more than one, in many cases, but the synthesis of all opinions, as displayed in the market clearing price, was favorable to the real.

Lastly, one should not miss the fact that with the floating of the new currency the Real Plan abandoned exchange rate indexation according to a PPP (purchasing power parity) rule, a big move both conceptually and on a practical level.

Adopting a float was to replace indexation by market determination. The direct and immediate consequence was the currency appreciation and, unsurprisingly, a big debate started on the merits of appreciation. The indexation rule to the exchange rate was established in the 1970s. Present exchange controls, it was understandable that exporters, for instance, looked at the exchange rate as concessionaries to a public service look at their tariff. Naturally they had an unfriendly look at appreciation and complained loudly.

This was how deep indexation rule had penetrated: there was no “market price” for the national currency, no market determined exchange rate. It was always a discretionary decision by the government, as if the “real exchange rate” was written on an implicit contract in order to secure a reasonable basis for economic activity<sup>63</sup>. Along these lines, if the PPP based readjustment did not happen it was by government’s fault and it would be government’s liability. It was like breaking a contract.

The fact was, that removing the PPP rule to this case, as for deindexation more generally, was the practical removal of a rigidity to a key relative price. This is how indexation works in a high inflation environment: changing relative prices becomes very difficult as all nominal price changes are always seen as caused by inflation and therefore changes to be *corrected*. A floating regime to a key price as the exchange rate was a major change: relative prices *could* change, and not necessarily an appreciation was a mistake or a distraction. Market prices could go both ways. Supply and demand would determine relative prices changes, and prices could very well fall in the presence of excess supply.

Deindexation is to recover the visibility of the price system.

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<sup>63</sup> Or to secure “contract equilibrium” as per Brazilian Civil Code wording.

It was pointless to argue that there was a lag in exchange rate readjustment as it appreciated, as there is no such argument when a bumper crop drives a commodity price downwards. Brasil was facing a capital surge and excess dollars.

## 5. Fundamental calculations

Let there be no doubt that the success of the new currency would depend on *fundamentals*, or on perceptions and expectations on fundamentals that could aptly anticipate their effects. There must be a sensation that some *regime change* happened, is happening, or will happen, to use Thomas Sargent's famous expression<sup>64</sup>. The question is how to define it, to deliver it, to construct the perception that the delivery is happening and to keep this perception alive.

One step back appears necessary: what exactly is the *regime change* that Thomas Sargent and his followers elect as the determining factor in the ends of big inflations? Is it a country specific package? Is it a combination of measures that the IMF staff can easily figure out? What markets would accept as enough to trust the new plan?

Sometimes the *regime change* depends on things out of the policy sphere: a diplomatic solution to war reparations, the redrawing of frontiers, the end of wars and revolutions or the completion of transition to or from socialism. In many cases there are dislocations that prevent stabilization altogether, one must remove these obstacles, or simply wait for them to fade away. Hyperinflations do not happen without *major* dislocations and will not disappear without these obstacles being removed.

This logic becomes more complicated in high inflation cases like in Brazil and Argentina, where there is not a very visible dislocation, like a war or a natural disaster. The *regime change* is about reforms, the fiscal accounts, and mostly about monetary institutions and governance, sometimes to be done with constitutional changes. But in these cases, it is less clear what could be the big confidence building *fundamentals* addressing package. How to see it when it keeps coming incrementally, without one major single announcement?

In the Brazilian case, it is fair to say the building up of *fundamentals* was a cumulative construction over an extended period. It was indeed too gigantic or too complex to be done in one shot. It may very well take a decade or more to

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<sup>64</sup> Thomas Sargent. "The Ends of Four Big Inflations", in Robert E. Hall (org.), *Inflation: Causes and Effects*. Chicago, The University of Chicago Press, 1982.

materialize. It all started with the PAI (*Plano de Ação Imediata*) initiative in June 1993, a rather ambitious list of fundamental adjustments and reforms. Its limited repercussion can be explained by the uncertainty about continued execution. It was just a wish list. Thoughtful and comprehensive, but just declared intentions of the fourth Finance Minister of Presidente Itamar Franco, with elections to happen in less than 16 months.

How do you increase the perceived chances of successful execution?

Executing. There was no other way.

A major opportunity existed in the fact that a Constitutional Revision was programmed to occur in 1993, and many difficult reforms could be streamlined in the fast-track mode defined for the Revision<sup>65</sup>. Unfortunately, however, political leadership abbreviated the Revision, so that only a few amendments could be approved. A key agreement was reached, however, through which, Cardoso's team could propose one amendment under the Revision's rites, to support the stabilization plan. Now famous FSE (*Fundo Social de Emergência*) Amendment was this key constitutional measure towards fiscal adjustment<sup>66</sup>.

Time is a very scarce resource in the business of stabilization policies, and one that needs to be stretched. Electing the finance minister president would certainly extend the execution horizon. Of course, there may be other formulas to secure an extended commitment to sound fiscal policies and reform agendas. However, a successful election is definitely the best formula in any democratic country to build the commitment to inflation fighting. Politics was at the very root of stabilization perspectives.

Brazil's lesson is simple as the 2023 Oscar for Best Movie: Everything everywhere all at once. It is on this context that observers, notably external ones, independent consultants and analysts from the Washington institutions, debated the Brazilian initiatives to address the true causes of hyperinflations, the so-called *fundamentals*, and how to address them.

In this connection, it is interesting to discuss this topic using Thomas Sargent's own writings of Brazilian stabilization attempts. Yes, Sargent himself wrote three "open letters do the finance minister of Brazil" in the exact same format

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<sup>65</sup> Only six amendments were approved under the Revision. From 1988 to 2023 the Brazilian Constitution had 131 amendments.

<sup>66</sup> ECR (*Emenda Constitucional de Revisão*) n.1, dated March 1st, 1994, the first day of URV existence. See Franco *A moeda e a lei, op. cit.* p.652 *passim*.

Keynes used to publicly write to French finance minister Raymond Poincare in January 1926<sup>67</sup>.

Keynes proposed some “fundamental calculations” to address the level at which the Franc should be set upon returning to gold. Sargent was thinking on the “monetarist arithmetic” when using Keynes’ template, this being a wonderful starting point for a conversation about the fundamental causes of Brazilian inflation.

Sargent’s first letter to a Brazilian finance minister was published in the Wall Street Journal in January 1986 and it was directed to Dilson Funaro, the finance minister in charge of the Cruzado Plan, the one famously introducing a price freeze, later to fail by avoiding addressing fundamentals of inflation altogether. That was an easy catch.

The second and third letters, directed respectively to Fernando Henrique Cardoso in November 1993, and to Pedro Malan in December 1995, referred to the Real Plan.

The second letter went unnoticed, as Cardoso was nothing like Funaro, and the Real Plan had all the requirements that the Cruzado Plan did not possess. The warnings about the importance of addressing fundamentals of fiscal equilibrium were well taken, but redundant. It was just one more external expert to support Cardoso’s agenda of adjustments and reforms.

The third letter<sup>68</sup>, entitled “a reasonable doubt about the real plan” was much more interesting. Sargent was clearly puzzled by the success of the Real Plan, then in the middle of its second year, with inflation running below 20% per year. The doubt was the following: after arresting inflation “mysteriously”, he argues, “changes in the fundamental determinants of inflation ... are difficult to find.”<sup>69</sup> Then he recycled his criticism of the German *rentenmark*<sup>70</sup>, but focusing on the URV, that he sees as a mere “change of units”, a “government-coaxed dollarization of accounts, but not payments”, possibly designed “to reduce the costs of posting price changes”. Along these lines, the URV was, to his view, a “technical detail, a sideshow that hasn’t touch the fundamental

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<sup>67</sup> Reproduced in the collection *Essays in persuasion*. New York: Harcourt, Brace and Company, 1932.

<sup>68</sup> The third letter was originally published in *Banco de Investimentos Garantia S. A. Economic Letter*, December 19, 1995. It was later reproduced in in a 2013 collected essays volume (Thomas Sargent. *Rational expectations and inflation*. Princeton University Press, 2013).

<sup>69</sup> Thomas Sargent *Rational Expectations and Inflation*. Princeton, Princeton University Press, 3<sup>rd</sup> ed., 2013, p.242.

<sup>70</sup> In his famous 1982 paper on the ends of four big inflations, he says: “while great psychological significance has sometimes been assigned to this unit change, it is difficult to attribute any substantial effects to what was in itself only a cosmetic measure”. Cf. “The ends of four big inflations”. In R. Hall (org.) *Inflation: causes and effects*. University of Chicago Press & NBER, 1982, pp.82-83.

causes of inflation”. In sum, he concludes, “The Real Plan so far is the boxing shorts awaiting the boxer, opera orchestra awaiting arrival of the singers. Until now, the audience has been satisfied with these signs that there will be a performance. It has not yet begun”.

These observations are very much like arguments raised in discussions with IMF staff during the final phases of Brazil’s Debt Renegotiation deal under the Brady Plan. The exchange of old debt for the new bonds was predicated on Brazil’s presenting US Treasury zero coupon bonds as collateral. The assumption was that Brazil would get financing for the acquisition of these bonds from the IMF in the context of a stand-by agreement. However, talks with staff did not go well, as they had restrictions to the Real Plan’s design and seemed inclined to see something like a currency board. But Brazil did not need the money (some US\$ 3 billion), neither the bad advice. At this moment, there was a wave of currency boards, sold worldwide as a consulting product<sup>71</sup>, and openly advocated as an *alternative* to a central bank, as much as today one argues that cryptocurrencies will turn government currency obsolete.

In any event, Brazil ignored the IMF and, in a few weeks, bought the US Treasury bonds in the secondary market and went forwards with the Brady exchange without the IMF stand-by agreement and blessing. Further, Brazil went along with the Real Plan and it worked wonderfully. Fundamental imbalances and reforms were duly addressed, this offering an interesting demonstration on how difficult is to see what a regime change looks like in real life. Experience also left abundantly clear that the URV was not a mere ornament, and that ending big inflations may require actions somewhat beyond the monetarist arithmetic.

Years later, in September 1998, after the Russian Crisis, Brazil sought the IMF for a large “preventive” agreement, as described at the time, aiming at stopping financial contagion. The agreement entered at this moment (mid 1998) lasted until 2006; it was a major impulse to fiscal enforceability in the following years<sup>72</sup>. Sargent was very much off target in his views on the URV, but he was definitely on the right direction as to fiscal accounts, even not seeing some ‘elephants’ the IMF staff tracked very closely: the states debt renegotiations (and implied conditionality imposed on sub-sovereigns), the financial impacts of large privatizations (normally implying some upfront spending or debt absorption by the Treasury), the extinction and or privatization of states’ banks (costly in the

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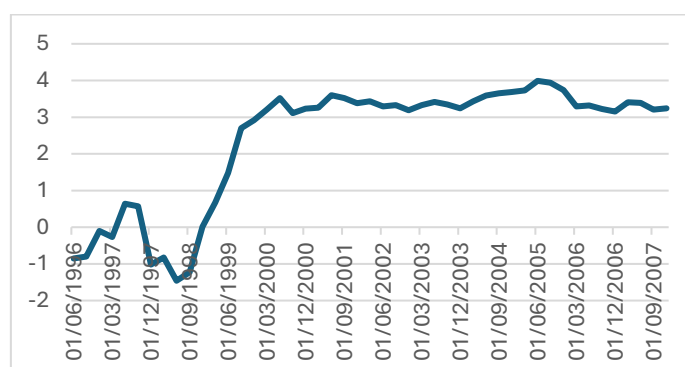
<sup>71</sup> Stephen Hanke & Hurt Schuler. *Currency boards for developing countries: a handbook* (revised edition, 2015).

<sup>72</sup> Detail on the agreement, its fiscal enforcement bias, and its implementation are discussed in Franco, *The Real Plan and the exchange rate ... op. cit.*

beginning), the capitalization of federal banks, and myriad fiscal measures listed in the PAI initiative, including fiscal responsibility law.

The numbers for the primary surplus in 1994 and following years seemed to justify Sargent's "reasonable doubt"<sup>73</sup>, to the extent that most of the heavy action on the fiscal front did not have but negative impacts on the primary surplus at first. But improvements were just around the corner, as seen in Graph 1. *Ex ante* skepticism seems justifiable, though more for Sargent than the IMF.

Ultimately, how could the plan be so successful in the absence of some major improvement in the primary surplus, presently, or just ahead?



Graph 1. Primary surplus, entire public sector, 1996-2007, % of GDP

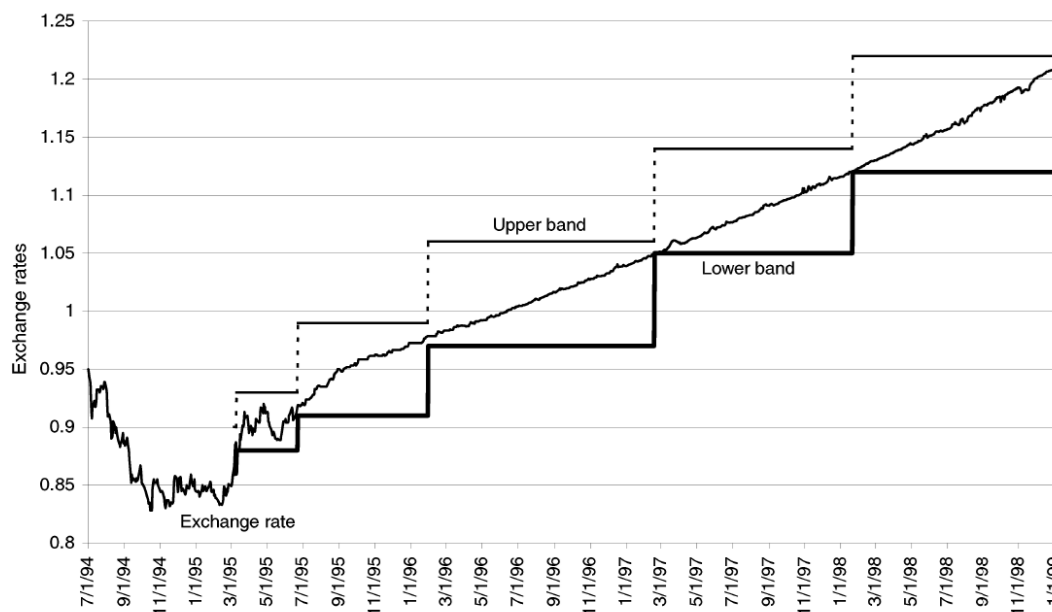
Experts pointed out that some key themes - "elephants", as referred to above - , had major long-term positive impacts, but often negatively affected the primary balance in the short run. Some of these big issues were just decisive to build expectations. Perhaps the public was more impressed by solutions given to Banco do Brasil, state banks, and to big privatizations, topics carrying lots of political weight, than by the smallness of the primary surplus at these early years. Perhaps, given complexities of Brazilian fiscal accounts and impacts of inflation and disinflation on public accounting, the primary surplus was not the one right indicator to capture all the action.

The fact was that, with the IMF Agreement at the end of 1998, a major fiscal improvement was finally seen in one single number, wiping away all these "reasonable doubts" about fiscal sustainability of the Real Plan.

<sup>73</sup> The same doubt was designated as a puzzle by Marcio Garcia, Diogo Guillén & Patrick Kehoe in "The Monetary and Fiscal History of Latin America: Brazil", *The Fiscal and Monetary History of Latin America: the case of Brazil*. Rio de Janeiro, Instituto Becker-Friedman, 2015.

## 6. The disinflation record

The phases of the exchange rate policy and the evolution of inflation in the early years of the Real Plan can better be seen in the graphs that follow, starting with the one describing the path of the exchange rate policy for July 1994 until late 1998.



Graph 2. Exchange rate policies: float and crawling bands

Graph 2 shows opening moves and follow ups from July 1<sup>st</sup>1994 to the end of 1998. First there was a float. From early July onwards until October 1994 the currency floated down until R\$ 0,83 to the Dollar. At this point the Central Bank, upon many requests, started to intervene to prevent further appreciation. Buy auctions were engendered. But it was not until February 1995 that the tendency to depreciate started to gain momentum, prompted by tensions created by the Mexican Tequila crisis. Some sell auctions took place on *ad hoc* basis, but without disclosing any intention to depart from a floating rate regime.

In March, the sensation was that unincumbered depreciation could do harm to stabilization. So far, stabilization has been a success: nine months had passed, and inflation was well behaved, popular support to the program was high and rising, first moves were highly successful, how to proceed? Would the interruption of the float be disruptive?

The Central Bank decided to introduce a new system for the exchange rate, attempting to establish and disclose intervention points, up and down, that is, a band of fluctuation, like the European target zone system, popular and respectable at the time<sup>74</sup>.

The first installment of the system, from March to July 1995 was somewhat bumpy, but in June the Central Bank introduced a game changer, the spread auction, implemented just as the large band was about to expire. Spread auctions introduced the so called *minibands*, as they were called<sup>75</sup>, after which the trajectory of the exchange rate smoothed into a *de facto* crawling peg.

After July 1995, with minibands and spread auctions in full operation, the float experiment has terminated, after one year in force. It is not often noticed that the first year of the Real Plan was under a floating exchange rate regime.

The “bands-with-craw”, or “crawling bands” system started mid 1995 was not following any price index or PPP calculation. It was deliberately arbitrary, to the tune of 8% per year, not to hint or indicate any indexation motive. It was optimistic if it was to consider the following 12 months inflation (13,7% according to IPC-r) but it was arguably a sizeable correction in real exchange rates after that. The concern with the current account deficit and overvaluation would be the next big challenge, as discussed below.

Meanwhile what happened to inflation? What was the impact of such exchange rate policies, or the exchange rate anchor, on inflation during the crucial first months of the Real Plan?

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<sup>74</sup> On the “barbed wire” effect and other feature of exchange rate bands, see Paul Krugman & Marcus Miller (orgs.) *Exchange rate targets and currency bands*. Cambridge University Press, 1992. Intermediary exchange rate systems were advocated at the time by John Williamson: “Exchange Rate Management: The Role of Target Zones”, *The American Economic Review* 77(2).

<sup>75</sup> Details can be found Franco, *The Real Plan and the exchange rate ... op. cit.*





Graph 4 intends to capture the dynamics of inflation in the months following the monetary reform, when inflation fighting was conducted on a more conventional mode, and the URV mechanism was already in the past. It shows annual rates that are 12 months accumulated inflation after July 1995. Before that, *i. e.* for the first 12 months of existence of the new currency the graph shows the average annualized rate of inflation for each period.

It starts with 121.2%, that is, the annualized version of 6.84% reading for the month of July 1994. For August, the graph averages inflation for these two months and convert this average into an annual rate, which gives a 66.1% reading. In September, for which the IPCA reading was 1,53%, the same procedure reads 49.0% for the average for this first three months.

For the first 12 months of the real's life the accumulated inflation was 33.0% in a smoothly descending trend, from 121.2% in July. Not bad for a country leaving hyperinflation behind, but still far from reaching normalcy.

The program proceeded; many actions on less visible fronts were implemented, and inflation continued to shrink. It fell below 10% per year in December 1996, month 30 of the new currency, and below 5% in January 1998, month 43. At calendar year, inflation was 5.2%, for 1998 it was 1.7% the lowest the Central Bank of Brazil has ever seen.

In sum, the first attack on hyperinflation, pictured in Graph 3 and based on a refined monetary reform technology (the proxy dollarization URV formula), reduced inflation from the region of nine to ten thousand percent annualized rates to 121.2%. Then, the second strike, from July 1994 to December 1998 brought annual inflation down to 1.7% per year, calendar year, as seen in Graph 4, month by month. This second chapter was conventional war, based on the exchange rate anchor and monetary policy, something like an infantry attack, that worked nicely because the fiscal cavalry was on its way, as shown by the primary surplus numbers pictured in Graph 1.

Was it the end of the journey? Was 1,7% low enough? Was it the end of the Real Plan saga?

The record of stabilization up to that point was nothing less than remarkable, and so was the homework on *fundamentals*, although sometimes not visible to foreign experts. But pressures were building to let the exchange rate float.

The issue of current account deficits, the level of reserves and the sustainability of the peg, and more generally of the Real Plan itself, seemed all linked at this point. The moment in which the inflation results were the best, appeared to be,

to many, the point of the largest fragility. It was the moment of crises in Asia and Russia, when fears connected to global financial contagion were at the peak. To that regard, one should examine the evolution of international reserves through these years, as shown in Graph 5 below.



Graph 5. International reserves, monthly levels, USD Million, December 1993 – October 2006

The floating rate episode at the onset of the Real Plan, in July 1994, started with international reserves at the very comfortable level of US\$ 43,1 Billion. One year later, in July 1995 it was US\$ 41,8 Billion. There was some oscillation downwards, mostly related to the confuse start of the exchange rate bands in March 1995; reserves touched US\$ 31.9 Billion in April 1995. After that, however, reserves climbed to US\$ 59.8 Billion on May 1996 and remained at the US\$ 60 Billion level until the Asian crisis late on the third quarter of 1997. Reserves touched US\$ 52.2 Billion in November 1997, given the impacts of the Asian crisis, but regained momentum to grow up to US\$ 74.7 Billion in April 1998, when the first rumors of troubles in Russia started to appear.

Developments after that, related to the effects of the Russian Crisis to Brazil are extensively discussed elsewhere<sup>77</sup>, there is little to add. Pressures were critical in Brady bonds' markets and in local FX derivatives, given leverage possibilities. It was a much-worsened repetition of the Asian Crisis sequence, aggravated by the perception that Brazil failed to deliver the fiscal package promised in the 1997 crisis response protocol.

The loss of reserves within the month of September 1998 was massive, similar in magnitude to all the gains from December 1997 to the peak levels in April

<sup>77</sup> Franco, *The Real Plan and the exchange rate ... op. cit.* section 7, Responses to the crisis started by Russia.

1998. On September 10<sup>th</sup> the Central Bank's monetary policy committee (COPOM) held an emergency meeting and raised SELIC rates to 40%. Shortly after on the 22<sup>nd</sup> the President announced in a speech that Brazil would seek assistance from the IMF to arrest the chain of contagion started in Russia. Not that Brazil had a problem with international reserves or with balance of payments issues, to need a conventional stand-by agreement. It was a question of fiscal enforceability, and to transform primary surplus targets into an international Treaty approved by Congress. Further, the showing of international support to Brazil and to the Real Plan was very impressive.

In the meantime, the presidential election took place and Cardoso was reelected on the first round, once again defeating Lula. Cardoso had no objection to massive interest rates to defend the currency and to an agreement with the IMF, all to happen during the election. He was recognized to be the political leader with the skills and stamina to face a global financial crisis hitting a newborn currency. By all indicators, including Brady bonds' markets and derivatives' trading, as election results were announced (at October 4<sup>th</sup>), it seemed that the tsunami had passed.

The predictable next step was to abandon the peg. After two successful but costly defenses, it appeared logical to return to a float not to repeat the routines launched in response to external crises in 1997 and 1998. The question was how to do it, especially in view of its potentially disruptive consequences to inflation. Majority opinion was that the existing mix had delivered good results, but time had come to a change. Yet, there was no consensus on the new formula, the President heard a couple of alternatives to think about.

The IMF could be part of the conversation this time; they were no longer committed to the currency board idea, but the staff made no secret they preferred an acceleration of the crawl rather than a float. Neither option was agreed in the program eventually signed. It was up to the Brazilians to decide, and there was no consultation with the IMF (and all the countries involved in the US\$ 41.5 preventive package) on the decision taken on January 1999.

The decision to change the exchange rate regime was taken by the President in the first week of January, with a view of reducing interest rates, according to his own detailed account. He reports on his January 6<sup>th</sup>, 1999, diary entry that there were different plans to change the exchange rate policies, different opinions as to how to conduct the transition and to what exact policy mix. He heard

different ideas, and his conclusion was loud and clear: “what I can no longer agree is this interest rate at the moon.”<sup>78</sup>

The President decided for the alternative proposed by BCB director Dr. Francisco Lopes, a somewhat heterodox transitional alternative (titled as *banda diagonal endógena* (DBE), literally “endogenous diagonal band”) mostly based on the notion it would change the exchange rate regime to a new target zone (band) system, solving the overvaluation issue but without any need to increase interest rates.

On his January 9<sup>th</sup> diary entry, the President clarified: “I took this decision all alone”<sup>79</sup> but, in retrospect, the President was not aware of the full details of the new formula<sup>80</sup>. The endorsement of some other economists may have been decisive for the President to go ahead with the BDE.

The decision to float the real was inevitable on Friday January 15<sup>th</sup> after the failure of the new BDE system, that had been introduced on January 13<sup>th</sup> when Francisco Lopes took office as interim BCB governor<sup>81</sup>; Selic rates were at 29,81%. It would seem *ex post facto* that the BDE was conceived as a shortcut or a prelude to a new float, but that was not the idea. Floating was the last resort, if the BDE did not work, yet it was the most celebrated outcome of this tumultuous week.

Lopes left the BCB shortly after, as the new system collapsed, and Demosthenes Madureira do Pinho took over as interim governor in February, with Selic rates hiked to 38,8%. Arminio Fraga became governor of BCB on March 3<sup>rd</sup>, with Selic rates at 39%, falling below 30% only in May. The year of 1999 was of exceptionally high interest rates<sup>82</sup> and the policy mix held up very well.

Floating started January 15<sup>th</sup>, 1999, and the results can be seen on Graph 6.

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<sup>78</sup> Cf. F. H. Cardoso *Diários da Presidência*, vol. 3, 1999-2000, São Paulo, Companhia das Letras, pp. 32-33.

<sup>79</sup> Cardoso, *Diários ... op. cit.*, p. 44.

<sup>80</sup> On January the 8<sup>th</sup> the President writes in his diary that Dr. Lopes brought him “a document” explaining how to “release monetary policy from exchange rate policy”. His comment: “the general lines I understood, but not the technical ones”. Cf. Cardoso, *Diários ... op. cit.*, p. 38.

<sup>81</sup> Gustavo Franco entered into a license in order to allow Lopes, then occupying a Directorship (equivalent to a deputy governor position), to assume the governorship as interim immediately to conduct the transition to the new system. Meanwhile Lopes started the approval process at the Senate. Shortly after, however, Lopes resigned and another director, Dr. Demosthenes M. Pinho, took over as interim governor. On March 3<sup>rd</sup>, Arminio Fraga Neto had completed the Senate approval process, was officially appointed by the President and inaugurated as governor.

<sup>82</sup> Selic rates finished the year below 20%, and in the year 2000 the Selic rate finished at 15,8%.



Graph 6. Exchange rates, real against the Dollar, Jul-1994- Jul-2007.

How would inflation react to the removal of the foreign exchange “anchor”? This was the question everyone was afraid to face. What would be the consequences of a float? Would progress in the inflation front be lost? Would a big depreciation be disruptive?

Graph 6 shows the behavior of the exchange rate after the float, in sequence to the movements since the beginning of the Real Plan in July 1994. The magnitude of fluctuations after January 15<sup>th</sup>, 1999, makes prior movements even difficult to see. The July 1994 float is barely noticed in Graph 6.

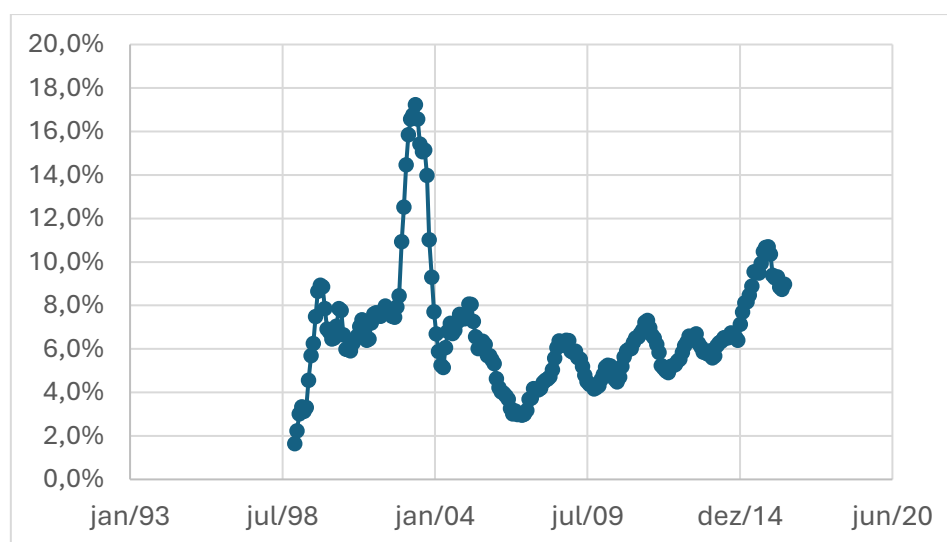
Two very clear episodes of quick and large depreciation can be seen in Graph 6, the first in 1999, in connection to the phasing out of foreign exchange bands, the second in 2002 in association to Cardoso’s succession. Both episodes are comparable to big devaluations in the past. Hardly anyone used language to these episodes as *maxi-devaluation*, as usual in the 1980s and before. It is different when the currency floats (is it?). Nevertheless, the range of fluctuations seen in Graph 6 was unprecedented.

In the first episode, in 1999, the real depreciated by 78,7% at the peak, comparing R\$1.2114, the Dollar at Jan 13<sup>th</sup>, with R\$ 2.1647, the quote on Mar 3<sup>rd</sup>. Compared with market averages for the 180 days after the float, the depreciation was to the tune of 50%.

In 2002, as presidential elections approached, and Lula appeared to be on the way to win, Graph 6 shows something like a repetition of the 1999 events: the real depreciated by 74.2% at the peak, comparing R\$2.2209, the Dollar on April

11<sup>th</sup> with R\$ 3.9552, the quote on October 22<sup>nd</sup>. Compared with market averages for the 180 days after the peak, the depreciation was again close to 50%.

The remarkable fact about these two depreciation episodes was the very mild inflationary repercussions, as seen in Graph 7 below, showing annual inflation rates (12 months cumulated change in IPCA) after January 1999.



Graph 7. Inflation rates, IPCA-IBGE, Annual Rates (12 months cumulative), Jan-1998-July-2015

Something important had changed; how to explain this small inflation repercussions of such giant devaluations (depreciations)?

As seen in Graph 7, in response to the 1999 float, annual inflation as measured by IPCA, moved to numbers next to but not larger than 10% *per year*, and later, in response to the 2002 depreciation, inflation crawled upwards next to but not larger than 18% *per year*. The acceleration of inflation on both occasions was incomparable to the hyperinflation numbers. No sign of the hyperinflation dynamics or spiral was seen after these exchange rate spikes.

Things have changed, and one significant change was the introduction of inflation targets as the prime anchor to inflation expectations. In fact, in 1999, Brazil explicitly embraced what was called the “tripod” (*o tripé*), that is, three key policies to be implemented simultaneously: inflation targets, floating exchange rates and primary surplus. This “1999 tripod” was a better version of the “1993 tripod” implicit at the PAI initiative, mentioned above<sup>83</sup>. It signaled consistency

<sup>83</sup> That was sound money, global citizenship, and fiscal responsibility. See Franco, *A moeda e a lei ... op. cit.* p.638-639 *passim*.

and adaptation to new circumstances; having the fiscal house in order and under IMF monitoring was certainly key.

When the inflation target system was introduced, in June 1999, shortly after the float, the targets then fixed for the first three years appeared too ambitious: 8% for 1999, 6% for 2000, and 4% for 2001, with 2% tolerance intervals for both sides. All annual rates, as if it had always been like that.

As it turned out, monetary policy fulfilled his mission. For the crucial first year, the annual variation of IPCA was 8.9%, a surprisingly good number, well into the tolerance band, an excellent start for the new system. In fact, an extraordinary result given a 50% plus exchange rate depreciation.

The target was also met in 2000, when IPCA varied 5.97%, but not in 2001, when IPCA inflation reached 7.7%, triggering the first “open letter” by the Central Bank to the Finance Minister presenting reasons for failing the target. In the following year, given instability produced by the election and a second major exchange rate depreciation episode, the target was missed again. It was fixed at 3.5% and 2002 inflation, for the calendar year, was 12.5%<sup>84</sup>.

Open letters notwithstanding, Brazil was under inflation targets with a 3% to GDP primary surplus and one-digit annual inflation, safely distant from the hyperinflation region.

All things considered; it is puzzling that the impact of exchange rate depreciation in 1999 was so small. How come that the tolerance to supply shocks had become so large? How could the pass-through (of exchange rate shocks into prices) be so small?

Much can be said on the construction of fiscal *fundamentals* to stabilization at this point, as already visible in the primary surplus numbers in Graph 1. This combined with inflation targets and the commitment to floating exchange rates – *o tripé* – with the explicit IMF blessing was a powerful indication of the policy stance. By all indications, the regime change, along Thomas Sargent’s lines had taken place.

But the explanation for the small pass through also resorts to *deindexation* taking place since 1994, although this wording may not be the best description of the

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<sup>84</sup> While the 2001 “open letter” was signed by Arminio Fraga, the 2002 “open letter” carrying the promise to place inflation back into the target, was signed by Henrique Meirelles, the central banker of the Lula government. What could be rupture was smooth transition.



abandonment of the high inflation regime since 1994. It appeared that living under low inflation, a new experience to Brazilians, was like a rediscovery of the price system. *Detoxification* from hyperinflation had many dimensions, and one important and very visible aspect was the reform of indexation laws in July 1995.

The so called “Deindexation Law”<sup>85</sup> sought a difficult compromise between a nominalistic wording with the full awareness of the impact of inflation to the economy, or the absolute absence of money illusion. This law had fixed one year as the minimum tenor to any contract or stipulation with an indexation clause, excepted financial markets. It also had changed rules of wage indexation in collective bargaining: rights to automatic wage readjustments according to past inflation at annual collective bargaining dates were no longer secured by law. After July 1995, wages have been put into a “free negotiation” regime.

This might have been important to explain the small inflationary impact of the exchange rate adjustments in the first semester of 1999.

Besides, it seems undisputed that the chemistry of the Brazilian economy as to its tolerance to supply (relative prices) shocks, or more specifically to exchange rate shocks, had changed very importantly.

The same can be said about competition, arguably more relevant at this point than in the past<sup>86</sup>, though the variation in the level of openness in the economy was not that significant.

In an empirical study on pass-throughs based on a panel of 71 countries’ episodes, including 1999 Brazil, Goldfajn & Werlang<sup>87</sup> found that pass throughs are relevantly affected by cyclical considerations and openness, and very commonly overestimated. Most importantly, their study confirms a finding of the established literature by which the size of (perceived) exchange rate overvaluation prior to the depreciation (devaluation) episode is crucial to determine the inflationary repercussions of an exchange rate adjustment. The basic thesis is simple: an exact (exchange rate) correction need not be

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<sup>85</sup> Initially *Medida Provisória* 1053/95 (known as *MP da desindexação*) reenacted many times before becoming Law 10192.

<sup>86</sup> E. Bacha. “A concorrência substitui a âncora cambial” in G. H. B. Franco (org.), *30 anos do Plano Real .... op. cit.* p.40.

<sup>87</sup> Ilan Goldfajn and Sérgio Werlang. “The Pass-through from Depreciation to Inflation: A Panel Study”. *Banco Central do Brasil Working Papers Series* n.5 September 2000. Werlang was deputy governor in charge of economic policy from March 1999 to September 2000, Goldfajn was Governor later, from June 2016 to February 2019.

inflationary<sup>88</sup>. This might be just like that once the high inflation environment is left behind and rigidity to real exchange rate changes is removed.

## 7. Concluding remarks, stabilization in perspective, its legacy

It is no exaggeration to argue that the Real Plan was one of the greatest stabilization experiences on record, as there is little debate that *the Brazilian inflation experience was one of the worst*, not only by sheer numbers, as documented on Table 2, but also because it had resisted several stabilization attempts, even a Gurley type monetary reform, in the few years prior to 1994.

After 30 years, one can safely say the monster has gone and lightly discuss dating of the Real Plan successful ending: was it December 1996 when annual inflation fell below 10% on a 12-month cumulative basis? Was it December 1997, when inflation for the full calendar year was 5.2% per year, or 1998, when it was 1.7% per year? Was it 1999, after the second episode of floating, the first year on inflation targets, with 8.9% within tolerance bands? Or 2003, the first year under Lula, with 9.3% inflation for the year, reason for an “open letter” from Henrique Meirelles to Antonio Palocci with a promise to do better the next year? Or was it 2006, when Brazil walked away from the IMF agreement, but with inflation at 3.1%, below the target of 4.5%?

This essay may have shown that the Real Plan was less planned than its designation would suggest. Stabilization *plans* are like that, supposedly. They are, by definition, path dependent exercises, like chess games, or football matches, or tournaments, analogies used above. They can be planned *only to certain extent*.

There were surprises of various types, especially from the political arena, economic shocks of all sorts, domestic or foreign, and moments of great uncertainty, as when the currency went into a float in 1994 and again under great stress in January 1999. Truth to the matter, however, uncertainty was there every day from day one. Looking at the final outcome one may hardly imagine how volatile the environment was at the heat of the moment, in the room where decisions happened.

There was little visibility and no horizon when plan makers started flying, and instruments were not especially reliable. External conditions were unstable, and

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<sup>88</sup> “These depreciations need not call for higher inflation, if they simply restore the real exchange rate to its steady state. In this case, the overvaluation would be corrected by a change in the relative price of tradables – non tradables, and the depreciation would not generate a generalized increase in prices”. Goldfajn & Werlang, *op. cit.* p.7.

the politics impossible to read. Cardoso started very discredited in May 1993 as the fourth Finance Minister nominated by President Itamar Franco before completing nine months in office. Nobody could possibly expect Cardoso to be successful to the point of being elected President, in the first round, one year and a half later. Accidental, was how he described this incredible trajectory, unquestionably connected to the success of the Real Plan<sup>89</sup>.

This remarkable experience changed profoundly the political economy of inflation so strong and counter to political culture the impact of Real Plan was. *Ex post facto*, that does not seem surprising as the Real Plan was a reconstruction of the national money; and there is nothing more social, plural collective and national than money<sup>90</sup>. The wounds caused by inflation were admittedly profound, and so were the impacts of defeating hyperinflation.

Popular reactions to the effects of the Real Plan left no doubt that inflation no longer occupies the same place it held on Brazil's equation of economic progress. In fact, what seems puzzling was how could Brazil had gone so wrong for so many years with respect to inflation. How could we believe that a tax on the poor would work to finance policies to curtail poverty? How insane this could be?

The answer probably has to do with theories according to which inflation was inevitable, either structural or inertial, the former having to do with the national identity, the latter with the past, both immune to change. Then comes the perception, or the experience that inflation is *functional*, either because it is the negative face of progress, the destructive part of creation, or because it performs the role famously described by Keynes of taxing the idle classes “a counterpoise against the cumulative results of compound interest and the inheritance of fortunes ... a loosening influence against the rigid distribution of old-won wealth and the separation of ownership from activity”<sup>91</sup>.

Yet, by far the largest distributional effect of inflation is the transferring of wealth in favor of the government, the so-called “inflation tax”, or the seigniorage revenues extracted as citizens are legally bound to accept the official paper money in payments<sup>92</sup>. Interestingly, inflation has been a solid building

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<sup>89</sup> Fernando Henrique Cardoso. *The Accidental President of Brazil: A Memoir*. Public Affairs, 2006

<sup>90</sup> Franco, Malan & Bacha, *op. cit.* p.13.

<sup>91</sup> J. M. Keynes “The social consequences of the change in the value of money” in *Essays in Persuasion*. Harcourt, Brace and company, New York, 1932, p.87.

<sup>92</sup> Much less known and more important to the Brazilian institutional organization of the budget process was the erosion that inflation caused in budget allocations. Also important in effect inflation had of taxes, the so called Tanzi effect. On the impacts of inflation to budget accounts see E. Bacha “Antecedents of the Real Plan: Spending contraction, interest-bearing money, and lagged indexation” *IEPE Casa das Garças Discussion paper* n.85, September 2024.

block of all Brazilian concepts of state led economic development, but never explicitly. It is rare to see allusions to Faust, or to faustian pacts, in debates on financing economic development<sup>93</sup>, and way easier to ignore inflation as an unintended consequence of economic development, like a negative externality.

It is feature of Brazilian politics that there is no open advocacy in favor of inflation. No recognizable inflation friends. Instead, however, there has been very consistent and frontal attacks to “orthodox stabilization policies”, to “fiscal responsibility” or to “spending ceilings” and with much better effects. No praise for the disease, only contempt to medicine (and doctors).

It is a subtle step to the side that is so important in Brasília, where the assignment of responsibilities is key. Inflation appears to be nobody’s fault.

Inflation is worse than simply undemocratic, insofar it works like a tax implemented without the parliamentary rites; and for at least two reasons: (i) it is a tax *on the poor*; (ii) it is a crime *without criminals*.

It is a tax on the poor because this is the least equipped group to engineer protections against inflation. Inflation’s negative impact on income distribution is well documented, and so is the positive impact of stabilization, as the Real Plan’s experience aptly demonstrated. Never again, after the Real Plan, it was argued that stabilization was detrimental to the poor or prejudicial to income distribution.

It is a crime with no criminals because inflation constituencies are very well disguised below several layers of theoretical criticism and conceptual reservations on the alleged negative effects of stabilization. In Brazil, there has been several Parliamentary Commissions of Inquiry into many features of stabilization and reforms, but there was never any inquiry into the causes and consequences of inflation. Even after decades of high inflation, the last 15 years before 1994 with 16% average monthly inflation, Brazil has never witnessed any consequential debate on who was to be held responsible. There have been inquiries into (failed) stabilization plans, into privatizations, all of them, into reforms, all possible hearings on every financial theme, but never an investigation into who is to blame for hyperinflation. Never.

It was just the perfect crime.

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<sup>93</sup> An exception worth mentioning, totally out of the mainstream economic debate in Brazil, is the essay on Faust in Marshall Berman’s *All that is solid melts into the air: the Experience of Modernity*. New York, Gardners Books, 1983.

But that has been changed by the Real Plan. By popular reactions to stabilization, to be precise.

There is nothing more popular than defeating inflation, especially when it comes without significant costs as regards unemployment. Most politicians lecturing the economists about how inflation fighting strategies should be designed to get popular support and thus political traction were flat wrong. It was not the price freeze, or the police actions repressing “economic abuses” that made heterodox plans popular, especially amongst politicians; it was price stability, that such plans accomplished only ephemerally.

The fact is that the public has learnt. Brazil’s inflation and stabilization experience was very rich. After all that, it seems that Democracy works against inflationism. Not that politicians learn economics. They did not. But voters acquired a better understanding of the inflation stabilization incentives. They can make better choices.

Democracy may be an effective deterrent of monetary irresponsibility since advocating inflation, even in the old and indirect way of attacking stabilization, results to be a bad electoral strategy. The popular vote seems to assign responsibilities much better than politicians.

## Appendix

Table A.1 (a)

Daily URV values in cruzeiros reais, January 1993 to July 1993

mês dia\	Jan/93	Fev	Mar	Abr	Mai	Jun	Jul/93
1	13,01	16,63	21,01	26,49	33,88	43,78	56,81
2	13,01	16,85	21,22	26,84	33,88	44,33	57,51
3	13,01	17,07	21,43	27,19	33,88	44,88	58,21
4	13,01	17,30	21,64	27,19	34,30	45,44	58,21
5	13,17	17,53	21,86	27,19	34,72	46,01	58,21
6	13,33	17,76	22,08	27,55	35,14	46,01	58,92
7	13,49	17,76	22,08	27,91	35,58	46,01	59,65
8	13,66	17,76	22,08	28,27	36,01	46,59	60,38
9	13,83	18,00	22,30	28,27	36,01	47,17	61,12
10	13,83	18,23	22,52	28,27	36,01	47,76	61,87
11	13,83	18,48	22,75	28,27	36,45	47,76	61,87
12	14,00	18,72	22,98	28,27	36,90	48,35	61,87
13	14,17	18,97	23,21	28,64	37,35	48,35	62,62
14	14,35	18,97	23,21	29,02	37,81	48,35	63,39
15	14,52	18,97	23,21	29,39	38,28	48,96	64,17
16	14,70	19,22	23,44	29,78	38,28	49,57	64,95
17	14,70	19,47	23,67	30,17	38,28	50,19	65,75
18	14,70	19,73	23,91	30,17	38,75	50,82	65,75
19	14,88	19,99	24,15	30,17	39,22	51,45	65,75
20	15,06	20,26	24,39	30,56	39,70	51,45	66,55
21	15,25	20,26	24,39	30,96	40,19	51,45	67,37
22	15,44	20,26	24,39	30,96	40,68	52,09	68,19
23	15,63	20,26	24,64	31,37	40,68	52,75	69,03
24	15,63	20,26	24,88	31,78	40,68	53,40	69,87
25	15,63	20,53	25,13	31,78	41,18	54,07	69,87
26	15,82	20,80	25,38	31,78	41,69	54,75	69,87
27	16,01	21,01	25,64	32,19	42,20	54,75	70,73
28	16,21	21,01	25,64	32,61	42,72	54,75	71,60
29	16,41	-	25,64	33,04	43,24	55,43	72,47
30	16,63	-	25,89	33,47	43,24	56,12	73,36
31	16,63	-	26,15	-	43,24	-	74,30

Obs.: - Cotações em Cruzeiros Reais  
Cotações para sábados, domingos e feriados referem-se à cotação do 1º dia útil posterior



Table A.1 (b)

Daily URV values in cruzeiros reais, July 1993 to February 1994

URV em 1/03/94:		647,50					
\mês dia\	Ago/93	Set	Out	Nov	Dez	Jan/94	Fev
1	74,30	98,51	132,65	178,97	241,65	333,17	466,66
2	74,30	99,91	134,65	181,68	245,02	333,17	475,31
3	75,26	101,33	134,65	181,68	248,45	333,17	484,11
4	76,22	102,77	134,65	184,44	251,92	338,52	493,09
5	77,20	102,77	136,68	187,24	251,92	343,95	502,23
6	78,19	102,77	138,75	190,09	251,92	349,47	502,23
7	79,19	104,24	140,84	190,09	255,44	355,09	502,23
8	79,19	104,24	142,96	190,09	259,01	360,79	511,53
9	79,19	105,72	145,12	192,98	262,62	360,79	521,01
10	80,21	107,22	145,12	195,91	266,29	360,79	530,67
11	81,24	108,75	145,12	198,88	270,01	366,58	540,51
12	82,28	108,75	147,31	201,90	270,01	372,47	550,52
13	83,34	108,75	147,31	204,97	270,01	378,45	550,52
14	84,41	110,30	149,53	204,97	273,79	384,52	550,52
15	84,41	111,87	151,78	204,97	277,61	390,70	550,52
16	84,41	113,46	154,07	204,97	281,49	390,70	550,52
17	85,49	115,07	154,07	208,08	285,42	390,70	560,73
18	86,59	116,71	154,07	211,24	289,41	396,97	571,12
19	87,70	116,71	156,39	214,45	289,41	403,35	581,70
20	88,83	116,71	158,75	217,71	289,41	409,82	581,70
21	89,97	118,37	161,15	217,71	293,45	416,40	581,70
22	89,97	120,06	163,58	217,71	297,55	423,09	592,48
23	89,97	121,77	166,04	221,02	301,71	423,09	603,46
24	91,12	123,50	166,04	224,37	305,92	423,09	614,65
25	92,29	125,26	166,04	227,78	310,20	429,88	626,04
26	93,48	125,26	168,55	231,24	310,20	436,78	637,64
27	94,68	125,26	171,09	234,75	310,20	443,80	637,64
28	95,89	127,04	173,67	234,75	314,53	450,92	637,64
29	95,89	128,85	176,29	234,75	318,93	458,16	
30	95,89	130,68	178,97	238,32	323,38	458,16	
31	97,12	-	178,97	-	327,90	458,16	

Obs.: - Cotações em Cruzeiros Reais

- Cotações de 19 dias úteis posteriores

