2 Argentina's Stabilisation Challenge

There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hidden forces of economic law on the side of destruction and does it in a manner which not one man in a million can diagnose.

(John Maynard Keynes)\(^7\)

This section describes the factors that led to the adoption of the Argentine currency board arrangement (CBA) in 1991. The central purpose of the currency board was to stop inflation, which had been plaguing Argentina since the middle of the century and particularly during the 1980s (the so-called “lost decade”), and which hit it especially hard with two bouts of hyperinflation in mid-1989 and early 1990.

Most high and hyperinflations share a common set of characteristics and a more or less typical sequence of events\(^8\). In order to understand the special problems Argentina faced in the late 1980s, these features will be named and qualified for the inflationary bouts that paved the way for the introduction of the currency board. Beforehand, a brief overview over the disinflation attempts that preceded this latest one will be given, as the Argentine history of failed reforms was an overwhelming argument for the adoption of the strict regime of the currency board.

2.1 Preceding Stabilisation Attempts since the Days of Perón

Since the Great Depression in the 1920s, Argentina had followed the political strategy of import substitution and closing the economy. This proved initially encouraging, especially during the years of the 2\(^{nd}\) World War, when Argentina built up substantial foreign exchange reserves from its agricultural exports that met a high demand worldwide. But the increasing tightness of administrative regulations and capital controls more and more hindered economic efficiency and growth, and produced corruption\(^9\). The populist policy of Juan Perón (president from 1946 to 1955) included broad nationalisation of enterprises, protection against foreign

\(^7\) Keynes (1920), p. 220.

\(^8\) For a comparative analysis of all hyperinflations in history, see Bernholz (2003).

\(^9\) An interesting link between prevailing corruption and left wing ideologies is explored by Di Tella/MacCulloch (2004).
competition, massive state intervention in the economy, and rapid wage growth. After having exhausted the country’s foreign exchange reserves, huge losses of nationalised enterprises and fiscal deficits were readily financed by printing money, which produced rising inflation.

Perón’s removal in a military putsch in 1955, which reflected popular discontent with inflation, corruption, demagoguery, and oppression, was followed by a period of political instability and further military putsches. High inflation eroded savings and living standards, unemployment rose. A first major stabilisation attempt in 1959 under president Frondizi, including monetary and fiscal discipline and a pronounced devaluation of the currency, proved initially effective but failed to deliver lasting stability. A second attempt in 1967 added heterodox elements of income policy to orthodox fiscal and monetary measures, but equally failed to produce stability in the longer run. A few months after Perón’s re-election in 1973, he died unexpectedly, with his wife Isabel following him and continuing in the same protectionist and populist policies. An ephemeral stabilisation attempt, initiated by the Peronist government, collapsed in 1975 after various speculative attacks. Economic deterioration and political instability paved the way for the military junta again seizing power in 1976. The following period, stamped the “guerra sucia” (dirty war), was not only the worst period of Argentina’s recent history in political and social terms, but eventually left the country with a deep economic and financial crisis, growing inflation and a rapidly devaluing currency.

Another stabilisation effort, the so-called “Tablita”, initiated by the military government in 1978, relied on orthodox measures and tried to establish the exchange rate as stabilising instrument, using a pre-announced devaluation schedule to control inflation expectations. This policy initially produced declining inflation rates (although slower than expected) and an improvement of fiscal accounts, but fell apart in 1981 after the resurgence of massive budget deficits, a deteriorated current account due to the massive real appreciation of the currency, and a severe banking crisis. A further stabilisation effort, announced by finance minister Alemann in 1981, was choked by Argentina’s invasion of the Falkland

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10 See Kiguel (1992), p. 103.
11 The Peronist Party’s official name is Partido Justicialista (PJ).
13 Végh cites the failed Tablita attempt as a textbook example for a non-credible, exchange rate-based stabilisation, generating a boom-recession cycle and U-shaped curves for inflation and the real exchange rate. See Végh (1995), pp. 64 ff.
Islands in 1982, itself representing a scarcely masked effort of the military government to divert attention away from the severe domestic problems. Warfare financing via money printing, as well as severely adverse external factors, such as decreasing international commodity prices, increasing foreign interest rates, the world-wide recession, and the world debt crisis, led to a culmination of the crisis in July 1982.

Inflation continued to increase and reached 6,000 percent during 1985. The so-called “Plan Austral”, launched by President Alfonsin in 1985, was supported by the International Monetary Fund (IMF) and included orthodox tight fiscal and monetary policy measures as well as price and wage controls. Again, it proved initially effective, but deficits returned massively after the effects of various temporary measures had petered out and the necessary fiscal reform was still not undertaken. Inflation started to rise again, and, as had happened after each of the previous programmes, reached higher levels than before. Two further heterodox programmes followed (“Plan Primavera” in 1988, “Plan Bunge y Born”\textsuperscript{14} in 1989, already initiated under president Menem), but they lacked credibility even from the start, as they did not tackle the main cause of inflation, the ongoing monetary financing of the budget deficit. Each of them produced ever higher inflation rates, runs on the currency, and ended with devaluations by several hundred percent\textsuperscript{15}.

Figure 1 summarises the chronology of the stabilisation programmes preceding the introduction of the currency board in 1991.

**Figure 1: Stabilisation Programmes in Argentina 1959-1990**

<table>
<thead>
<tr>
<th>Name of Programme</th>
<th>Date of Start</th>
<th>Date of Crisis/Abandonment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Frondizi)</td>
<td>1959</td>
<td>n.a.</td>
</tr>
<tr>
<td>Alemann</td>
<td>12/1981</td>
<td>7/1982</td>
</tr>
<tr>
<td>Bunge y Born (BB)</td>
<td>7/1989</td>
<td>2/1990</td>
</tr>
</tbody>
</table>

Sources: Choueiri/Kaminsky (1999), and Kiguel (1992), own arrangement.

\textsuperscript{14} The programme was named after Argentina’s largest transnational company, the advisors of which were involved in the programme design.

Since the collapse of the “Tablita” in 1981, exchange rate management was highly discretionary and changed between fixing and floating the exchange rate, with dual exchange rates and capital controls prevailing over long periods\textsuperscript{16}. In February 1990, the exchange rate was floated and all price controls removed. Currency reserves were nearly exhausted. Argentina approached hyperinflation and a total economic collapse. In the year between March 1989 and March 1990, the price level rose by 20,000 percent. Real GDP fell in 1989 by more than seven and in 1990 by more than two percent. Argentine real per capita income declined by 26 percent during 1980-89\textsuperscript{17}.

Figure 2 gives an overview of Argentine inflation over the seven decades preceding 1989. Figure 3 concentrates on the decade 1980-1990.

**Figure 2: Inflation in Argentina 1920-1989\textsuperscript{(1)}**

<table>
<thead>
<tr>
<th>Period</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920-29</td>
<td>-1.7</td>
<td>17.1</td>
</tr>
<tr>
<td>1930-39</td>
<td>-0.3</td>
<td>13.0</td>
</tr>
<tr>
<td>1940-49</td>
<td>10.6</td>
<td>31.1</td>
</tr>
<tr>
<td>1950-59</td>
<td>30.3</td>
<td>111.6</td>
</tr>
<tr>
<td>1960-69</td>
<td>23.3</td>
<td>31.9</td>
</tr>
<tr>
<td>1970-79</td>
<td>132.9</td>
<td>444.4</td>
</tr>
<tr>
<td>1980-89</td>
<td>750.4</td>
<td>4,923.3</td>
</tr>
</tbody>
</table>

\textsuperscript{(1)} CPI change in %, annual basis.

Source: Cavallo (1996).

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\textsuperscript{17} See Leijonhufvud (1990), p. 2.
2.2 High and Hyperinflation in Argentina in the 1980s

Inflations occur in different magnitudes. They are generally classified along the three broad categories of moderate inflation, high inflation, and hyperinflation. There is no generally agreed clear delimitation line between moderate and high inflations – though annual price increases between 5 and 10 percent are mostly offered as the limit where high inflations start. A qualitative criterion has been proposed by Bernholz, who defines an economy as moving into high inflation as soon as the (corrected) real stock of money starts to decline.  

The delimitation between high and hyperinflations is less disputed. Since Philip Cagan's classic study of German post-World War I inflation, his definition of hyperinflation as price rises exceeding monthly rates of 50% has become generally accepted. This criterion is in rough accord with the observation that during moderate inflations, a quotation of inflation in percent per year is sufficient for economic agents, whereas in higher inflations, people measure price increases in per cent per month. When the effective time horizon for quoting money prices falls below one

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(1) Rates of increase between the final months of each period.

Source: Oficina de la CEPAL en Buenos Aires, on data of INDEC, BCRA, and other sources.

19 He defines the corrected real stock of money as the nominal money stock divided by the price level and corrected by the growth of GDP. See Bernholz (2003), p. 2.
month, the economy is considered to be in hyperinflation. Thus, we end up with the mentioned approximate numerical delimitation between high inflation (up to 50 percent per month) and hyperinflation (higher than 50 percent per month)\(^{21}\).

A more qualitative distinction between high and hyperinflation lies in the observation that high inflations can be sustained for years, whereas hyperinflations rapidly lead to economic collapse\(^{22}\). It is generally agreed that hyperinflations should be treated as extreme cases of high inflations, since they share the main characteristics of the latter but eventually render financial and economic conditions unsustainable. Therefore, studying hyperinflations implies studying high inflations as the latter deliver the basic insights in the complex interaction of causes and effects of inflation and its persisting detrimental impact on the financial sector and the real economy.

"Inflation is the observable outcome of a complex process of political and economic interaction in society."\(^{23}\) The observable outcome is an increase of the price level over a certain period as measured by one or several price indices\(^{24}\). Such an increase is the result of pricing decisions previously made by innumerable firms and individuals. Obviously, these pricing decisions are the most direct cause of inflation. But behind them lie market and policy signals, and behind them again still other economic and extra-economic causes. Some chains of causation in the complex structure of interaction even loop back on themselves in a way that causes and effects over time become indiscernible – the so-called "price-wage spiral" being the most prominent example. Examining the complete picture of causes and effects in the complex interaction called inflation becomes a near to impossible task.

\(^{21}\) For orientation: a constant monthly inflation rate of 50 percent would result in an annual rate of 12,874 percent. The corresponding weekly and daily rates would be 10.67 and 1.36 percent respectively.

\(^{22}\) See Végh (1995), p. 38f. He uses the term "chronic" inflation for high inflation more or less constantly persisting over years, and differentiates between cases in which chronic inflation never developed into hyperinflation (as, e.g., in Uruguay), cases where hyperinflation took off without preceding chronic inflation (Bolivia), and cases where chronic inflation eventually accelerated into hyperinflation (Argentina).


\(^{24}\) This is the generally accepted criterion. Other criteria, such as e.g. the expansion of the money supply or of credit, are possible and have in history at times been more at the centre of attention. See Bernholz (2003), p. 1.
Delving into the vast and controversial field of inflation theories lies beyond the scope of this investigation. The purpose of the following paragraphs is less to analyze than to describe the characteristics of high and hyperinflation economies in general and of the Argentine case of the 1980s in particular, and, in consulting economic and political data, to draw the most plausible conclusions about the relevant cause-and-effect-structures. In doing so, it will nevertheless become clear that the neo-classical concept of money (neutral) and of inflation (affecting only nominal magnitudes, and, apart from a fiscal distortion due to the inflation tax, leaving the real economy functioning as normal) is of little use for the explanation of high and hyperinflation. More adequate models of high inflation are necessarily less clear-cut as they try to account for the complexity of the matter. As will become apprehensible, high and hyperinflations must be regarded as "pathological processes" and "the products of socio-political persistence in negative sum-games".

### 2.2.1 Rising Money Stock

As Milton Friedman famously noted, "inflation is always and everywhere a monetary phenomenon". Indeed, it is an uncontested and empirically well-documented fact that all persistent inflations are accompanied by a rising stock of nominal money.

While price level increases cannot occur without commensurate increases in the money stock, it is important to note that the money stock growth is usually less than proportionate since the demand for real balances declines. It is identical to say that the velocity of money circulation rises, as people effectuate the same volume of transactions with reduced amounts of cash that are turned over more frequently in order to minimise losses of purchasing power of the money held. Thus, in

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25 For a detailed argument over existing inflation theories, see Heymann/Leijonhufvud (1995).
26 Leijonhufvud (1990), p. 2.
28 This can be illustrated with the equation of exchange as expressed by Irving Fisher, $M^*V = P^*T$: given a constant volume of transactions ($T$), a rising money stock ($M$) translates into more than proportionately rising prices ($P$) if and when at the same time the cash balances held by the public decrease – or, expressed the other way round, the velocity of money circulation ($V$) increases: $V$ is reciprocal to the cash balances held by the public ($k$): $V = 1/k$. 
Argentina, M3 amounted only to little more than 10 percent of GDP in 1989 and to around 5 percent in 1990\(^{29}\).

The charts of figure 4 depict the exorbitant nominal money stock growth in Argentina during 1989 and 1990. Note that due to the scale necessary to catch these increases, the already very high money growth of the previous years – Argentina experienced high inflation during the whole of the 1980s – gets out of sight in these diagrams. To meet this shortcoming, the logarithmic plots are added for each of the diagrams.

**Figure 4: Base Money, Money Circulation, and Money Aggregates 1984-1990**

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2.2.2 Government Finance

Clearly, the rising money stock itself is not the ultimate cause of inflation. Typically, in high inflations, the government's financing requirements induce it to allow the money stock to rise at an inflationary rate. Rather than Milton Friedman's "monetary phenomenon", and as will become palpable further on, high inflations can...
better be described as "processes of unreliable interaction between the public and the private sector"\(^{30}\).

All high inflation histories have in common the persistent failure of fiscal policies to operate within its means\(^{31}\). That said, it is not primarily the size of budget deficits that determines the inflationary outcome. Rather, it is the fact that the creation of money originates in the government's need for funds.

Given the undoubted relationship between monetary financing of budget deficits and inflation, does it also extend to full-blown hyperinflation? Kiguel (1989) shows that this is clearly the case. As soon as a government increases the size of its budget deficit to a level that exceeds the maximum inflation tax obtainable, an explosive path of inflation is taken\(^{32}\).

Figure 5 shows the Argentine budget deficits during the 1980s. They reached maximum levels during the first half of the decade. As Heymann (2000) notes, the lower deficit levels towards the end of the decade do not properly reflect the seriousness of the fiscal situation: the more the economy approaches extreme conditions of very high and hyperinflation, the more deficit magnitudes are restricted by the abrupt fall in credit supply to the government and the decline in real money balances - which constitute the "tax base" for the inflation tax. Thus, the pressures on public finances during the late 80s were vastly higher than the figures suggest\(^{33}\).

\(^{30}\) Leijonhufvud (1990), p. 2.

\(^{31}\) See Bernholz (2003), pp. 69 ff. Bernholz substantiates this by the empirical study of all 29 hyperinflations that occurred worldwide until 2003. All but four of the examined hyperinflations were connected with budget deficits of 20 and more percent of expenditures.

\(^{32}\) The decisive link is a perpetuated disequilibrium in the money market: money press financing of an increased deficit creates a temporary excess supply in the money market, thereby generating an increased rate of inflation. This reduces the demand for money, which further prevents the money market from clearing. Accelerating inflation which develops into hyperinflation is the result. This is independent of the assumption on the formation of expectations (adaptive or rational). See Kiguel (1989).

2.2.2.1 Inflationary Bias of Governments

What is the motivation behind a (democratic) government's decision to finance deficits via inflation? Public choice theory emphasises the so-called political business cycle, which describes the incentives of elected governments to choose and time their policies so as to maximise their chances of being re-elected. These chances are highest when the benefits of policy actions enjoy the highest possible popularity while the costs are distributed over the electorate as widely as possible, and thus felt as little and late as possible. Higher taxes to finance popularity-enhancing policies are counterproductive as they incur the costs of lost support from the taxed. Instead, higher borrowing is attractive as it does not hurt anyone immediately. The debt-financed additional spending, if timed well, stimulates the economy prior to the election, while the debt service will hurt later, after the election. Over time, however, the debt service consumes ever higher proportions of revenues, pushes market interest rates up and so crowds out investment. At some point, the perception that the government is an insecure debtor may even add significant risk premia to interest rates.

In such a situation – already highly indebted and struggling to gain voters' support –, the incentive for the government to choose money creation to help finance the deficit is very high. In the short run, it prevents higher interest rates and allows stimulating the economy, while the negative consequences of inflation occur...
only after the next election. Moreover, inflation has the additional “benefit” of reducing the debt stock in real terms. If the government chooses to fight inflation afterwards, it has to stop doing so in time and to produce new inflation in order to prepare for the next election. The consideration of the political business cycle thus leads to the assumption of an inherent inflationary bias of democratic governments. This will all the more be the case in times of slow or negative growth (when higher taxation is even less of an option), or of wars or international tensions (which offer the excuse of an extraordinary situation).

Figure 6 highlights the two years when presidential elections took place in Argentina: in 1983, after the defeat in the Falkland war and the collapse of the military regime, when Raúl Alfonsin of the so-called Radical Party won the presidency, and in 1989, when Carlos Menem of the Justicialists (“Peronists”) took over in July amidst the first bout of hyperinflation. While the political business cycle argument will doubtlessly be demonstrable for several of Argentina’s previous elections, the peculiarity of Argentina’s situation in the 1980s seems to forbid explaining much of its inflationary performance in this way. Both elections were staged on the background of catastrophic economic (and, for 1983, political) situations, with an electorate plagued by high inflation and disillusioned since decades. The economic situation in neither year left much room for economic stimuli generated by expansionary monetary policies. Therefore, for the considered decade in Argentina, the political business cycle was certainly not of much relevance.

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34 Of course, autocratic governments are subject to similar incentives to secure their power. History provides very few examples of dictators that withstood these temptations due to their personal ideological belief or benevolence.
However, Argentina doubtlessly constitutes a model case of another instance of governments’ inflationary bias. This is related to its fiscal federalism, i.e. the distribution of tax revenues between the federal state and the provinces. Argentina’s inflation in the 1980s is at least partly to be regarded as an outcome of the fierce political struggles over the allocation of tax revenues between national and provincial jurisdictions. For instance, payments to the provinces under the distribution scheme were strategically delayed, to dilute their real value and change the real primary distribution. Thus, inflation served to mend the national budget ex-post, in effect softening aggregate budget constraints. Clearly, inflation again fed back and gave incentives to the provinces to press for an automatisation of distribution mechanisms, thus rendering them even more inefficient and increasing budgetary pressures.

2.2.2.2 Debt Structure

Existing government liabilities in high inflation countries typically differ significantly in structure from those of stable economies: owing to their instable past, they have shorter maturities and higher rates that already include inflation.

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36 This scheme, the so-called “coparticipación”, will be discussed in more detail later.

37 During the debates that preceded the new (and current) law for federal fiscal relations in 1988, the threat of inflating the economy as a last resort (in order not to have to further concede in distributional negotiations) was even pronounced expressly by the federal government. See Saiegh/Tommasi (1999), p. 197.
expectations. Foreign debt forms an important proportion of government debt when high yields have previously attracted speculative capital imports.

Often, the government at some point stops servicing foreign debt, or leaves its commitment to repayment vague. New lending from abroad is then near to impossible. With these financing restraints, governments are tempted to take recourse to indirect borrowing in the form of setting high reserve requirements on bank deposits. The result is a reduction in bank credit to the private sector – an indirect form of crowding out. Under extreme pressure, the government may also fall back on delaying payments to suppliers or state employees. Whether and to which degree liabilities are repaid is at some point either arbitrary or determined by the pressure exerted by single creditors.

As the public perceives the financing restraints, the possibility of default enters their expectations and calculations, and increases interest premia. The increased interest burden in turn renders default more probable, and a run similar to a banking panic may occur, itself precipitating default.

Figure 7 shows the financing of the Argentine government's debt during the 1980s. Domestic debt played the paramount role in the first half of the decade, but ceased to offer much financing potential towards the end. The proportion of public debt financed from abroad shows a marked rise after the intermediate stabilisation attempt of 1985, but declines again over 1988-1990. The depiction of public foreign debt in absolute terms, as shown in Figure 8, confirms the finding that the Argentine government found itself increasingly indebted and struggling to find creditors at home and abroad during the final years of the 1980s.

Moreover, with high reserve requirements, the government has to pay interest on reserves, in order not to cause large spreads between borrowing and lending rates of banks. See Heymann/Leijonhufvud (1995), p. 64.
2.2.2.3 Are Budget Deficits a Cause or a Consequence of Inflation?

There is a case for asking whether the causation might not be reverse, so that budget deficits are caused by inflation. Indeed, the lag between receiving and spending public funds works to reduce their purchasing power by high inflation, with the consequence that the real budget deficit grows even when expenditures are...
kept constant (the so-called Olivera-Tanzi effect). Thus, high inflation complicates fiscal management and in effect feeds on itself\(^ {39}\).

The proof that budget deficits are not initially caused by inflation can be seen in the observation that in nearly all historical cases massive budget deficits preceded the occurrence of high inflation. Since these deficits generally cannot have been financed exclusively on capital markets, the financing of the budget deficits via the money printing press has to be regarded as the initial trigger\(^ {40}\).

Figure 9 confirms this reasoning for the Argentine case: massive budget deficits in the early 1980s preceded the most significant increases in yearly inflation rates of 1984/85 on the one hand, and of 1989 on the other.

**Figure 9: Budget Deficit and Inflation 1980-1990**

![Graph showing budget deficit and inflation](image)

Sources: Worldbank, 2003 World Development Indicators and Oficina de la CEPAL en Buenos Aires on the basis of official data.

### 2.2.2.4 Erosion of Tax System

Whereas stable economies most of the time manage to bring their projected spending in line with their actual or potential taxing capacity, high inflation economies are characterised by a loss of control over their budgets.

Inadequacies of the tax system typically account for much of the budget deficits. The most important taxes, VAT and income tax, usually would offer much more financing potential if properly collected. Instead, governments often impose various

\(^{39}\) See Kiguel (1989), p. 156.

\(^{40}\) See Bernholz (2003), p. 72.
excise taxes at high rates that cause significant distortions and yield little compared with other sources of taxation.

Tax collection is erratic and inefficient, since the performance of the public sector in general, and also of the tax agencies, gets worse the more the economic disorder caused by high inflation radiates. Corruption and tax evasion get widespread, but even for honest taxpayers there are often legal loopholes and exemptions.

With high inflation, the time lag between tax accrual and collection reduces real tax revenues. The ever-present incentive for taxpayers to pay late is magnified by the additional inducement created by inflation, and real tax revenues dwindle further. Indexation of taxes would offer no solution since the time-lag problem is unavoidable.

The first chart of figure 10 shows that Argentine tax revenues covered highly variable proportions of GDP over the decade (between 8 and 14 percent). Tax revenues never exceeded 15 percent of GDP, which is a poor proportion compared with industrial countries with proportions nearer 50 percent, as well as with emerging economies’ average levels (around 20 percent). The tax structure equally proves to have been very instable, as displayed in the second chart: taxes on income, profits, and capital gains form a minor part of tax income, whereas taxes on goods and services over most of the decade covered more than a third of total government revenue. Thus, Argentina’s tax system on the whole failed to offer sufficient and stable government revenues. Not covered by official tax numbers, of course, is the increasing proportion of inflation tax that made up for deficient tax revenues.

Figure 10: Tax Revenue and Tax Structure 1980-1990
2.2.2.5 Lack of Structured Budgeting Process

Fiscal stability requires a rational and well-defined budgeting procedure where conflicts over the distribution of funds are dealt with in a simultaneous negotiation between all entitled groups, and where the result becomes legally binding for the whole of the fiscal year. Furthermore, it is important that there is no "shadow budget", but that all items of public activity are included in the official budget.

With high inflation, it becomes impossible to project budgets for a whole fiscal year. Planning horizons shorten, and renegotiations, often without due parliamentary legitimation, become more frequent. Negotiations with pressure groups are not conducted simultaneously, but sequentially, which renders an ultimate control of expenditures near to impossible. Then, there is neither potential nor incentive for claimants to negotiate compromises with each other, and each group tries to maximise its own stake. Government departments, provincial and local governments, public utilities, nationalised industries, and other fund claiming organisations thus all work in the same direction, i.e. towards a maximisation of the deficit. The threat to reduce public services, e.g. in hospitals or schools, works to push their claims through, with the effect that these groups de facto operate under "soft budgets"\textsuperscript{41}.

\textsuperscript{41} The phenomenon of soft budgets also affects the private sector: with high inflation, money fails to be a reliable unit of account, and calculation and cost control become impossible. E.g., to
Often, extraordinary expenditures, e.g. for warfare, reparations, or foreign debt service, worsen the budget additionally. Furthermore, the government typically faces financing restrictions as government debt is not marketable in the required volumes and/or at reasonable interest rates. The result is not only allocation inefficiency and inequality, but also time-inconsistent and non predictable budgetary policies.

Under these circumstances – unable to contain expenditures, to raise sufficient funds by conventional taxation, and to borrow from the public – there is a strong incentive for governments to rely on money creation to finance budget deficits. At that point, a clear line between fiscal and monetary policies cannot be drawn any longer.  

The Argentine public sector of the 1980s offers a textbook example of these characteristics. A widespread codex of behaviour among officials and functionaries, developed over decades at least, was characterised by nepotism and corruption, rulings by decree, and a disregard of any legal and judicial institutions meant to secure checks and balances. The procedures around the official budget were shaped correspondingly. In addition to the pressures generated by high inflation, the financing of the Falkland war and the mounting foreign debt services put massive strain on the budget.

2.2.2.6 Inflation Tax

The government’s proceeds from money creation, the so-called seigniorage, results from the real value of newly created base money as well as from the loss of purchasing power of the existing money stock. The latter element in effect acts like a tax levied upon holders of money. However, this “inflation tax” differs from other forms of taxation in an important aspect: it is not decided upon in the same formal way and by the same body as are regular taxes, but rather represents a kind of

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42 In the case of complete reliance on money creation for the financing of a budget deficit, the real value of the monetary increase must match the real budget deficit. For a formal foundation see Heymann/Leijonhufvud (1995), pp. 14ff.

43 Any compendium of Argentina’s history in the 20th century, like e.g. that of the Encyclopaedia Britannica, reads like a seemingly endless repetition of the same political behaviour patterns, interchangeable between civil and military governments.
“emergency” finance for a government unable to stick to a consistent fiscal policy and to withstand political pressures on the budget.

The inflation tax is easy to impose and collect, but carries high social costs compared with other forms of taxation. First, there is the amount of time and effort spent by individuals to economise on cash balances in order to reduce the “tax base”. These efforts imply huge overall efficiency losses. Second, the incidence of the inflation tax is strongly regressive: lower income people’s cash balances form a higher proportion of their wealth than those of the better-off, and their possibilities to evade or minimise taxation are less.

The general relationship between tax rates and tax revenues is generally described by the Laffer curve. Applied on the inflation tax, an economy can be located either on the “good” side of the Laffer curve (where higher inflation leads to higher seigniorage revenue) or on the “bad” side (where higher inflation reduces seigniorage revenue due to a reduced money demand). When seigniorage is raised in excess of the revenue-maximising inflation tax (i.e. the maximum set by the prevailing demand for money), inflation accelerates and, if not fought back, eventually moves towards hyperinflation.\footnote{See Kiguel (1989), p. 149. It is the inflation elasticity of the money demand and the size of the fiscal deficit in relation to the maximum seigniorage revenue that decide upon an economy’s location on the Laffer curve.}

For the Argentine case, Kiguel/Neumeyer show that for most of the 1980s, the economy stayed on the “good” side of the Laffer curve, i.e. increases in inflation yielded increases in seigniorage revenue. During the period of 1982/84, however, seigniorage reached levels (over 7 percent of GDP) that could not be sustained by a stable rate of inflation, and it can be argued that the economy was from that time on an explosive hyperinflationary path – a view that is supported by the fact that inflation doubled in 1983 and again in 1984. After the intermediate Austral stabilisation attempt, seigniorage reached excessive levels again in 1989 (around 9 percent of GDP), and hyperinflation took off.\footnote{See Kiguel/Neumeyer (1995), p. 681.}

Inflation reduces the real value of regular tax revenues. The inflation tax therefore must be higher than the real losses in other tax revenues to prevent total government revenues from decreasing. By increasing inflation, real tax revenues decline further, and the inflation tax revenues have to grow further – a vicious circle that results in accelerating inflation. Data on the inflation tax show that in the 1970s,
a 4 to 5 percent monthly inflation rate yielded seigniorage of about 5 percent of Argentina's GDP, whereas in the late 1980s, a monthly inflation rate of 15 to 20 percent was necessary to produce the same yield\textsuperscript{46}.

Finally, an important theoretical consequence is that, if money is issued to cover public financing needs in real terms, monetary growth becomes itself dependent on the inflation rate, and the money stock is determined endogenously\textsuperscript{47}. The fiscal deficit then remains as the only exogenous variable in the complex picture of high inflation.

Figure 11 shows the overall deficits of the Argentine non-financial public sector and the way these were financed for three periods of the 1980s. Seigniorage always played an important role in financing the deficits.

**Figure 11: Fiscal Deficits, Seigniorage, and Inflation**

<table>
<thead>
<tr>
<th></th>
<th>1979/80</th>
<th>1982/84</th>
<th>1986/87</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal Deficit</td>
<td>7.0</td>
<td>14.6</td>
<td>5.9</td>
</tr>
<tr>
<td>Net Borrowing</td>
<td>5.4</td>
<td>4.6</td>
<td>5.9</td>
</tr>
<tr>
<td>Seigniorage</td>
<td>5.2</td>
<td>7.8</td>
<td>3.7</td>
</tr>
<tr>
<td>Inflation (annual average)</td>
<td>128.3</td>
<td>340.4</td>
<td>109.7</td>
</tr>
</tbody>
</table>

All figures in percent of GDP, except for the rate of inflation which is percent per year.

Fiscal deficit = domestic borrowing + central bank loans to the treasury.

Source: Kiguel/Neumeyer (1995), on data from World Bank, IFS, and DATAFIEL\textsuperscript{48}.

### 2.2.3 Monetary Regime

#### 2.2.3.1 Monetary Constitution

Clearly, the monetary constitution plays a key role in the explanation of inflation. Historical evidence yields the conclusion that economies with currencies based on a metallic (gold or silver) standard experienced little or no inflation, whereas paper money standards have been more prone to inflation. Within paper money standards, those with central banks independent of political authorities, or those bound by a regime of fixed exchange rates to stable currencies (that are themselves either on a metallic standard or managed by an independent central bank) are less inflation-biased\textsuperscript{49}. Clearly, budget deficits can be financed via money creation only when the


monetary authority can (i.e. is not legally bound to keep a certain ratio between the domestic money base and foreign exchange reserves) and will (i.e. is not legally and de facto independent from the government) accommodate the government's needs. The criteria “central bank independence” and “exchange rate regime” are not independent: a central bank stringently bound to maintain a fixed exchange rate necessarily has to have a high degree of independence of political authorities. Hence, at least for developing countries, it can be assumed that the type of exchange rate regime matters more for the inflationary outcome than mere central bank independence.

Before the 1991 Convertibility law, Argentina’s central bank never enjoyed any notion of independence. As in most developing economies, Argentine civil as well as military governments kept ready access to central bank financing. Justification could always be constructed from the central bank’s Keynesian-inspired charter. Suiting central bank governors were appointed and at will replaced by the respective governments.

As to the exchange rate regime, there were basically two different regimes in Argentina during the 1980s. The famous “Tablita” period (lasting two years from January 1979 until January 1981) included a pre-announced path of a devaluing exchange rate, and was characterised by a high degree of international capital mobility, and market-determined interest rates. The ensuing period, from spring 1981 until the end of 1989, saw higher restrictions on capital flows and fixed exchange rates with discretionary, unannounced devaluations, and the development of parallel markets for foreign exchange.

Thus, over much of the decade, the central bank tried to use the exchange rate as a nominal anchor for disinflation, but was less than successful, because there

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50 However, inflation-averse monetary constitutions may well carry some long-term risks of inflation: as investors feel secure from inflation by the performance of a central bank that is either independent or bound by a fixed exchange rate, they are prepared to lend at lower yields, which in turn encourages governments to borrow more. Rising debt ratios at some point are likely to lower the hurdles that stand in the way of a government choosing to get hold of the central bank. Also, it can be shown that the monetarist hypothesis that a constant budget deficit exclusively financed by the issue of bonds is non-inflationary is at least partly invalid. See McCallum (1984).


52 The Argentine central bank’s charter stems from 1935, the Bank’s founding year, and was designed (primarily by Raúl Prebisch) to put an end to the previous currency board, and – in the light of the experiences during the Great Depression – to implement a then completely new, anti-cyclical monetary policy.
were neither important efforts to tackle the problem of lax fiscal policy nor attempts to restrain the government’s access to central bank financing. Rather, frequent changes in regulations regarding interest rates and foreign exchange markets led to more financial instability (which was only temporarily alleviated by the Austral plan and the accompanying liberalisation of interest rates around the middle of the decade). Widespread macroeconomic instability persisted over the whole of the decade, developing into the extremes of hyperinflation from 1989 onward.  

2.2.3.2 Monetary Policy

Monetary policy in high inflation economies typically does not follow any pre-defined long-term rule or self-commitment. Rather, it is determined by actual economic conditions and political pressures, and it reacts to these pressures in a short-term discretionary manner. Decisions to accelerate, keep constant, or decelerate the growth of the money stock are made on the basis of currently pressing necessities without consideration of their effects in the long run. That means, for the economic agent, that the uncertainty in predicting future price levels increases exponentially with distance from the present, and the more so, the more frequent and important monetary policy actions are.

The rapid change of governments and economic policy staff may underline this point for Argentina: between 1980 and 1990, Argentina saw 6 different presidents, 11 ministers of finance and economy, and 10 central bank governors, chosen out of military, Radical and then Peronist ranks.

The explanation of such conduct of monetary policy generally focuses on the time inconsistency problems associated with the reliance on the inflation tax. Governments in high inflation economies are supposed to maximise inflation tax revenue in the short run and not to commit themselves to a certain inflation limit. In other words, their time preference is strong enough as to increase seigniorage in the short run at the expense of higher inflation and lower seigniorage in the long run.

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54 This is called a „random walk monetary standard“ by Heymann/Leijonhufvud (1995), pp. 50ff.
55 For the period between 1945 and 1990, the respective numbers are: 19 different presidents, more than 40 ministers of economy and finance, and equally more than 40 central bank governors. See e.g. the central bank’s homepage at www.bcra.gov.ar.
Yet, as will be shown below, the interaction between the government’s incentives and the expectations of private agents leads to an acceleration of inflation rates and a reduction of inflation tax revenues.

2.2.4 Inflation Expectations

The demand for real money balances is dependent on the expected rate of inflation: the higher inflation expectations, the lower the amount of money an individual wants to hold. Assumptions over the formation of the public’s expectations therefore are central when trying to predict the reaction to price increases.

One way of forming expectations about the future is to look back and project the past development into the future. Such adaptive expectations (as described by Phillip Cagan in 1956\textsuperscript{57}) are accurate only under the condition of a constant rate of inflation. With rising inflation rates there is a chronic lag of adaptive expectations behind actual inflation rates. Backward-looking expectations in a wider sense include more data than the inflation rate itself and may calculate the expected inflation rate as a stable function of past data.

Forward-looking expectations, in contrast, are based on anticipated future developments. Most influential is the hypothesis of rational expectations (as formulated in 1961 by John Muth\textsuperscript{58}), according to which the unboundedly rational economic agent is able to predict the inflation rate on the basis of any available information, including statistical data and theoretical models as well as political assessments. For instance, when given financing needs of a government are expected to be financed by the inflation tax, a rational economic agent can estimate a rate of money creation and translate it into an expected inflation rate.

In high inflation episodes, neither the model of adaptive expectations nor the over-ambitious notion of perfect foresight fit well with the actual behaviour of the public. A more realistic approach to the formation of expectations is to acknowledge the fact that the conditions determining an economic outcome are far too many and too complex for any individual to be adequately reflected in her decision making. Economic agents cope with this complexity by developing certain “reasonable” rules.


\textsuperscript{57} See Cagan (1956).

\textsuperscript{58} See Muth (1961).
and simplification strategies. Such reasonable rules are determined by the particular state of and experience with policy-making authorities: the public has gained experience in recognising the patterns that govern policy-decisions. In forming expectations through pattern recognition in government behaviour, an individual relies on incomplete information and is well aware of the limits of her ability to predict future policy actions.

Therefore, even in a stable environment, different sets of observations, different internalised "models" and different interpretations of facts across individuals must to a certain degree lead to an incoherent "collective state of expectations". When past government action has been unsystematic, expectations and ensuing behaviour are in addition likely to get highly volatile. Then, in the interaction between policy makers and the public, no one can rely on the behaviour of the other, and the outcomes of actions get unpredictable.

2.2.5 Symptoms of High Inflation

Price instability affects every aspect of economic activity in the public as well as the private sector. It forces everybody to pay heed to it in even the commonest daily transactions. Indeed, the capacity of individuals to live with high inflation is sometimes astonishing. It grants that economic activity can go on for a long time – in an inefficient, resource-wasting and socially damaging way.

2.2.5.1 Decreasing Demand for Real Money Stock

As previously pointed out, a decreasing stock of real money can be observed in all high inflations. The explanation is straightforward: economic agents try to rid themselves of money before it loses much of its purchasing power. At the same time, the economy as a whole is swamped by an increasing nominal money stock. As the demand for money decreases while its supply rises, prices rise more quickly.

59 "The modern economy has not evolved fully to exploit the cleverness that its inhabitants possessed all along. Rather it has evolved to a complexity beyond human understanding, because people with limited cognitive capabilities have devised ways of getting along without dealing with the full complexity of the system." Leijonhufvud (1990), p. 19.

60 And, vice versa, political authorities have learnt how the public behaves. This set of mutual expectations on the part of the public and of policy-making authorities is caught by the concept of the "monetary regime". See Heymann/Leijonhufvud (1995), p. 39.

61 Heymann/Leijonhufvud call this an "unreliable regime". Regimes can be reliable on the part of political authorities either through a gained reputation of consistent behaviour or through rules imposed on its behaviour. See Heymann/Leijonhufvud (1995), p. 43.
than the money supply. The real stock of money, defined as the nominal stock divided by the price level, falls.

The reduction of real money balances claims high costs in terms of time and transactions used to synchronise payments and receipts. The efforts undertaken are not only a matter of individual choice, but sometimes also require co-ordination between transactors, as e.g. between companies that agree on deals to temporarily shift unwanted surpluses of money when their respective cash flows are out of phase, or between firms and employees agreeing on a shortening of payment periods. Often, these efforts also include physical investments – one example is the speeded up installation of automatic teller machines\textsuperscript{62}. All those efforts are necessary because money retains its property as a medium of exchange, although taxed exorbitantly.

The same volume of transactions is now performed with smaller amounts of real money. This is possible with three major developments observable during high inflations: the rise in money velocity, a return to barter trade, and increasing currency substitution.

\textbf{2.2.5.2 Currency Substitution}

In high inflations, the reverse of Gresham's law is working: good money drives out bad money, the latter quickly losing value (given flexible exchange rates between the two)\textsuperscript{63}. The typical sequence in the course of accelerating inflation is that, first, foreign currency is used as a unit of account, then as a store of value, and finally as a means of payment. Data on the use of foreign currency circulating is scarcely available, as governments are interested in financing their deficits via the inflation tax, i.e. enforcing the use of the domestic and suppressing the use of foreign currency. Strict foreign exchange controls are often enacted, and circulating foreign currency made illegal.

Currency substitution not only offers people a currency with a lower "relative price" to meet their money demand. It can be shown that a high degree of currency substitution also reduces the rate of inflation of the original currency. This can be explained by the fact that the rate of inflation required to sustain hyperinflation, i.e.

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{62} These investments allow to operate with lower money holdings permanently, which means that stabilisation will not bring back previous levels of money demand. This hysteresis effect lowers the base for the inflation tax in the long run. See Heymann/Leijonhufvud (1995), p. 87.
\item \textsuperscript{63} This can also be called Thier's law. See Bernholz (1995a), pp. 98 ff.
\end{enumerate}
\end{footnotesize}
to induce people to hold less money, is reduced during the process of financial adaptation, and especially dollarisation. In Argentina, to compensate for the rapid decline in value, domestic currency was increasingly replaced by the US-Dollar, starting with Dollar denomination of longer-term financial assets and the use of Dollars on markets for real assets and durable consumer goods, to extend to ever shorter financial assets and more everyday products. One illustration of this is the development of foreign currency deposits, as shown in figure 12 (note that the first chart denotes foreign currency deposits as percentage of M3 which, as shown above, itself exploded towards the end of the decade). In 1991, 40 percent of deposits were denominated in Dollars.

Another dimension of currency substitution is the exodus of capital out of the inflationary country. By 1987, an estimated 45 billion US-Dollars were stored abroad by Argentine investors, a number which increased by much during the following years.

**Figure 12: Foreign Currency Deposits 1980-1990**

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64 See Sturzenegger (1994). He explains the lower levels of inflation during the second bout of Argentine hyperinflation in early 1990 with the rapid increase in currency substitution during and after the first bout in mid-1989.


2.2.5.3 Undervaluation as a Consequence of Currency Substitution

Most high inflations produce a real undervaluation of the domestic currency, i.e. the nominal exchange rate does not reflect the relation of the price levels of the domestic economy and the respective trading partner's. In other words, the nominal exchange rate rises, i.e. devalues, faster than domestic prices (corrected by foreign prices). Where foreign exchange controls prevent the official exchange rate from rising, it is the black market (or parallel) exchange rate that moves towards an undervaluation.

According to Bernholz (2003), the reason becomes obvious when considering the individual calculation of a money holder: comparing the opportunity costs of holding domestic or foreign currency, the value of domestic money for future uses has to be discounted by more as it is subject to higher inflation rates than foreign money. Therefore it is valued less than the prevailing purchasing power parity would imply.

However, limits to the degree of undervaluation (and to currency substitution) are given by three facts: First, the undervaluation of the domestic currency works to encourage exports and discourage imports with the result of a higher supply and

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68 That is, the purchasing power parity is not granted: the nominal exchange rate \( e_n \), defined as the price for a unit of foreign currency expressed in domestic currency, exceeds the relation of the domestic \( P_{\text{int}} \) to the foreign price level \( P_{\text{ext}} \): \( e_n > P_{\text{int}} / P_{\text{ext}} \).
69 For a formal model that derives undervaluation from the comparison of present values of holding domestic or foreign currency, see Bernholz (2003), pp. 90ff.
lower demand of foreign currency, which tends to counteract the undervaluation. Second, governments usually penalise the holding of foreign currency, i.e. the increased costs of holding it moderate the above calculation. Third, and with the same effect, the widespread use of domestic currency makes its holding comparatively more sensible, as it is easier to find trading partners accepting domestic currency.

Figures 13 and 14 depict the development of the Argentine currency’s nominal and real exchange rates during the 1980s. Nominal as well as real exchange rates show increases at the beginning of the decade and, more significant, in 1989, whereas the mid-1980s saw modest declines following the intermediate stabilisation of the Austral.

Figure 13: Nominal Exchange Rates 1980-1990

(1) Averaged monthly rates.
(2) These numbers refer to the average exchange rate in foreign trade, measured as simple average of the rate which is applied for import payments and an export exchange rate which is derived from a weighted average (on the basis of the export structure of 1993) of the effective exchange rate for primary export payments and of that for other export payments allowing for rights or tax incentives.

Source: Oficina de la CEPAL en Buenos Aires on the basis of official data.

The real exchange rate can be defined from different perspectives. One is to correct the nominal exchange rate by the relation between the price levels abroad and at home: \( e_r = e_n \times \frac{P_{ext}}{P_{int}} \), with \( e_r \) being the real, \( e_n \) the nominal exchange rate, and \( P_{ext} \) and \( P_{int} \) the exterior and interior price levels, respectively. The other is to focus on the relative prices of tradable and non-tradable goods: \( e_r = e_n \times \frac{P_t}{P_{nt}} \), with \( P_t \) being the price of tradables and \( P_{nt} \) the price of non-tradables. Of course, under the simplifying assumption that tradables’ prices are set by the exterior, while non-tradables’ prices reflect the domestic price level (and allowing for the snag that the domestic price index also includes tradables’ prices), both aspects condense to the same content.
Figure 14: Real Exchange Rates 1980-1990

(1) Real exchange rates are defined as: nominal exchange rate * international price index / domestic price index. They have been calculated in different modes by using as international price indices alternatively: the price index of Argentine exports, here called XPI (expressed in US-Dollars), and the CPI of the United States of America, and as domestic price indices: the Argentine CPI and WPI.

(2) The first of the indicators (Foreign Trade Exchange Rate*XPI/CPI) is calculated by using an average exchange rate for exports which is derived from a weighted average (on basis of the structure of 1993) of the effective exchange rate applied to primary export products and of that applied to other export products. The two following series are calculated by using an average exchange rate for foreign trade which is measured as a simple average of the effective exchange rate for exports as defined above and the effective exchange rate for imports.

Source: Oficina de la CEPAL en Buenos Aires on data of the INDEC and other sources.

2.2.5.4 Acceleration and Variability of Inflation

Beyond a certain level, inflations have the tendency to accelerate. Explanations are inherent in many of the points discussed above: for one thing, while the nominal money stock increases as the government tries to finance its budget deficit, the propensity to hold money declines, and prices rise even faster than the money stock. This mechanism is amplified by the Olivera-Tanzi effect according to which the real budget deficit grows due to the loss of purchasing power of government income alone. Moreover, currency substitution reduces the “tax base” on which inflation tax can be imposed so that the “tax rate” must rise to generate equal revenues.

The most disturbing factor for the real economy, however, is not acceleration itself, but the variability of inflation, which is empirically also shown to rise with inflation rates. Thus, inflation gets less predictable the higher it becomes.

This unpredictability causes typical reactions with economic agents and severe distortions in the real sector. Considering how prices are set is illustrative in this

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respect. With accelerating inflation, producers and traders realise that their usual calculation method does not serve them any longer. The mark-up method, by which producers add a profit margin to the production costs, leaves them with real losses as the input has become more expensive over the time of the production process. Traders cannot replenish their stocks at prices that are covered by the proceeds of their effectuated sales. Their reaction is a change in the calculation paradigm: selling prices are no longer based on the input costs de facto paid but on the input costs that are expected to prevail at the time of selling the product — usually calculated with the help of price indices. In other words, backward-looking price-setting behaviour is replaced by forward-looking behaviour.

As inflation not only accelerates but also gets more variable, this kind of calculation gets hazardous. Inflation variability aggravates the main problems inherent in using price indices through the effect that higher inflation variability causes the real value of indexed prices to get more variable as well. Increasingly variable inflation leads to even more inadequate price settings than would be the case with merely rising inflation, and to highly variable real and relative prices.

Monthly statistics fail to capture most of intramonth price variability, and this is all the more the case for yearly data. Correspondingly, Blejer (1983) demonstrates for the period between 1977 and 1981 that individual commodity prices in Argentina fluctuated over a much wider range than the aggregated CPI, and that the captured disparities are much smaller on a yearly than on a monthly basis. Moreover, he found that the deviation of individual price rises from the monthly mean is due to few large single rises, and that this "skewness" increases with inflation.

2.2.5.5 Real Price and Wage Variability

With accelerating and variable inflation rates, real prices inevitably get desynchronised with respect to the inflation rate. This is largely due to the existence of "menu costs", i.e. the fact that prices cannot be changed instantly to reflect every change in inflation, although the intervals of price adjustments generally shorten with rising inflation rates. The reaction of price setters is, each time prices are

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73 The situation of importers is somewhat better in that their, much more reliable, "index" is the exchange rate. With rising inflation, using the exchange rate as an index spreads gradually throughout the economy so that foreign exchange is the measure behind nearly all pricing decisions even if it is not (yet) used as a means of payment. See Bemholz (2003), p. 96.
changed, to include into their prices the inflation expected until the next price change. Therefore, prices are set at higher levels than would correspond with the actual inflation rate, but in the course of rising inflation fall below that level – until the next price rise occurs.

The result is a seesaw pattern of real prices, with peaks at the time of price rises and subsequent steep declines until the next peak. Not surprisingly, this pattern also applies for the development of real wages. When inflation adjustment in wages is no longer settled in regular negotiations but gets subject to a price index, the deflections are supposed to get shorter and less extreme, but this is again counteracted by the increasing variability and acceleration of inflation. Apart from allocation inefficiencies caused by highly variable real product and factor prices, highly variable real prices and wages have a significant potential to disadvantage wage earners.

Figure 15 shows longer-term trend shifts in real prices and wages. Overall, Argentine real wages decreased steadily from 1984 until 1990. They fell between 1985 and 1990 alone by around 25 percent, thus continuing a trend that had begun in the mid-seventies\textsuperscript{75}. The relation between industrial products and industrial wages, itself more variable over the decade, shows a marked rise in the two years up to 1989 and thus reflects a decline in wages in relation to prices of industrial products.

Of course, besides prices, the institutional determinants of nominal wages play the other role in real wage development. Here, it appears that massive government interventions since the days of the military regime in Argentina, covering anything between wage freezes and restrictions in trade union activity, probably contributed at least as much to the decline in real wages as inflation\textsuperscript{76}.


\textsuperscript{76} For the institutional and economic determinants of wages see, e.g., Waisgrais (2003).
Figure 15: Prices and Real Wages 1981-1990

(1) Industrial prices are measured by the national, non-agricultural WPI excluding typical Pampa products. Service prices are components of the CPI. Public and private services correspond to the international classifications CUCI and GCE (Grandes Categorías Económicas).

(2) Normal salaries are defined as the sum of basic salaries (including extra hours) and bonuses and gratifications. They are unit values of the salaries paid during the reference period.

(3) This refers to the average normal and permanent salaries, which are defined as the sum of basic salaries (including extra hours, bonuses and gratifications). They are unit values of the salaries paid during the reference period. Moreover, real salaries are defined as the amount of nominal salaries earned within a month, deflated by the average of the CPI of the current and the following month as an estimate of the value of the payment at month’s end.

Source: Oficina de la CEPAL en Buenos Aires on data of the INDEC and other sources.

2.2.5.6 Distortion and Excess Variability of Relative Prices

The characteristics of inflation and price behaviour described above – acceleration and increasing variability of nominal and real prices – necessarily result also in distortions of relative prices, i.e. in prices of one class of goods as expressed in another class of goods. An increase in relative price variability is observable both across different products and across the same products at different locations. Different pricing schemes of various classes of goods add to these inherent distortions and may render them grotesque. Most conspicuous are dislocations between goods with fix (or “sticky”) as opposed to flexible prices, or with regulated as opposed to unregulated prices. Also, large single movements in relative prices are often caused by “external” disturbances such as devaluations or discrete adjustments in public sector prices. Of course, these distortions reflect back on inflation and increase its variability.

A sufficiently stable structure of price relations within an economy forms the backbone of calculation and orientation of any economic behaviour. The rising instability in the gridwork of relative prices causes manifold violations of the “law of
one price”, with the effect that market forces no longer work to coordinate supply and demand. Markets become more fragmented and local prices more sensitive to specific shocks and idiosyncratic expectations. The system gets less well-coordinated both across space and over time. The limits are reached under the conditions of hyperinflation when agents cannot predict even the most immediate outcome of their economic actions and consequently reduce their exposure to business to a minimum.

Although relative price distortions are directly tangible for people living through high inflations, they are – as is the case with highly variable nominal and real prices – rarely adequately reflected in the statistics. While the more lasting components of relative price distortions are visible in month-to-month and longer-term data, the high intramonth (or even intraweek or intraday) variability of relative prices (the “noise” component) is not caught by monthly observations. Therefore, the positive relation between inflation rate and relative price variability seems to get weak at very high inflation rates.

The co-existence of nominal rigidities in some prices, arising from frictions in price setting (“menu costs”), and a high degree of flexibility in other prices are generally perceived as an important source of relative price distortions. Accordingly, sticky prices are to blame for much of these distortions as they fail to closely follow the inflation rate. While the discrete and belated adjustment of nominal wages to inflation is the most important example, there are many other inter-sector and inter-firm price coordination tasks that include stickier and less sticky prices and that fail to produce efficient outcomes in high inflation.

A further typical distortion in high inflations is the distortion between goods and services supplied (or regulated) by the public sector on the one hand and privately supplied and priced goods and services on the other hand. Often, governments try as long as possible to keep prices for public goods low compared to overall inflation. Therefore, prices such as regulated rents for social housing, railway fares, and publicly supplied energy and water grow very cheap in relation, e.g., to food or clothing.

\[\text{77 However, empirical studies find that fix prices march more in parallel with the relevant indices than do flex prices. This reflects the observation that accelerating inflation leads to a higher than average number of fix prices being adjusted. Deviations of inflation from the trend therefore reflect these adjustments of fix prices, and not, as could be expected, the faster response of flexible prices. See Leijonhufvud (1990), p. 11.}\]

\[\text{78 See Ball/Romer (1991).}\]
Real estate and company shares also lose in relative value. This seems surprising since real assets are generally considered safe havens from inflation. But when rents are regulated, real estate loses its revenue potential and thus its value. The loss of value in company shares can be explained by the loss of information corporate reports provide: numbers become more meaningless the more the unit of account becomes unreliable. The evaluation of corporate performance becomes impossible, and stock markets cease to function properly. As a consequence, stock prices lag behind general inflation because the dividends paid are lower in relation to the reported net profits than was the case before the inflation.

Another source of relative price distortions arises from different kinds of wage setting. Although wages generally lag behind inflation to a certain degree, this is less so for unskilled labour, whose wages are to a higher degree set by trade unions and/or possibly indexed. The higher skill and wages, the bigger gets the gap between wage development and inflation.

Examining relative prices of three broad product classes (food, non-food goods, and services), Blejer (1983) found for Argentina in the years 1977 to 1981 that the group of services showed a marked upward movement in its relative price. Furthermore, relative price variability within the food sector was much higher than within other sectors. Moreover, he showed that an opening of the economy (i.e. an increase in import-competition) worked to reduce relative price variability of domestic prices.

Figure 16 shows that Blejer's finding of services (here the denominator) growing relatively more expensive (here in relation to industrial products) applied also for the years 1983 to 1987, but shows the reverse development before and after, when prices of industrial products rose even faster than those of services. As for the different types of services, the relation of industrial products to public services shows less marked changes than the relation of industrial products to private services, implying a much closer linked development between industrial products and public services – in Argentina, the government obviously did not try to keep prices of public services artificially low. As the second chart of figure 16 shows, over

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80 See Bernholz (2003), pp. 98 ff. He gives empirical and anecdotal evidence for the Austrian and German hyperinflations of 1922 and 1923 respectively.
81 See Blejer (1983).
the decade, pampa products lost in relative value against industrial products – hurting the important Argentine agricultural sector.

**Figure 16: Relative Prices 1981-1990**

![Graph 1](image1.png)

![Graph 2](image2.png)

(1) Industrial prices are measured by the national, non-agricultural WPI excluding typical Pampa products. Service prices are components of the CPI. Public and private services correspond to the international classifications CUCI and GCE (Grandes Categorías Económicas).

(2) This measures the relation between two components of the WPI: the price index for industrial products as defined in the previous note and a compound of goods (primary, e.g. wheat, bovine livestock, and manufactured, e.g. beef, flour, vegetable oil) which are typical Pampa products or derived from such.

Source: Oficina de la CEPAL en Buenos Aires on data of the INDEC and other sources.

### 2.2.5.7 Contracting Strategies

As inflation rates and relative prices become highly variable in high inflations, their anticipation becomes a difficult task. Uncertainty increases with the length of...
planning horizons. There are different strategies to cope with this kind of uncertainty, each of them suitable for different kinds of transaction, and each of them observable in high inflation economies.

First, nominal contracts remain only if they refer to very short time horizons. This is the case in wholesale and retail markets for consumer goods, services, and intermediate products. Nominal contracting also remains in markets for short-run interest bearing assets, which are in strong demand from three sides: people try to move both out of money and out of long-term contracts, and speculative trades that exploit differences in inflationary expectations increase. But the higher and more erratic inflation, the shorter get the maturities of deposits people accept to hold, and in the extreme case of hyperinflation people refuse to keep deposits at all.

Second, longer-term contracts, for which re-negotiation is costly, such as property leases, longer-term customer-supplier relationships, and labour contracts, deal with uncertainty by including index clauses.

There are several problems with indexing: one is the question, which index, i.e. which basket of goods, to choose. Linking payments to one of the officially published price indices is attractive in several respects: they are available for all at the same time, they cannot be manipulated by the contracting parties, and bargaining costs are reduced. Furthermore, there is a certain stabilising effect when the practice of linking payments to the same index (usually the CPI) becomes widespread, because it imparts inertia on the inflation rate, which in turn limits the variability of the real value of payments. The main problem with indexing is that it is necessarily backward-looking and implies a reporting lag. This does not matter too much if the inflation rate is sufficiently steady, but causes serious misalignments between actual price movements and those reflected by the index in states of highly variable and accelerating inflations. Then, especially long indexed contracts generate highly variable real payments. The consequence is that, with highly erratic inflation, indexing will remain only up to a certain duration of contracts, and beyond that limit markets disappear.

The third strategy, dollarisation, offers a way out of the reporting lag, for the exchange rate is a price that is continuously measured and announced. But

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82 Heymann/Leijonhufvud formulate the assumption that the duration of the longest remaining indexed contracts corresponds to the period during which the variance of the inflation rate remains within certain tolerance limits. See Heymann/Leijonhufvud (1995), p. 99.

indexing to the exchange rate also has drawbacks because the real exchange rate in high inflations also becomes very volatile, and because it is not a domestic but a foreign basket of goods over which the exchange rate offers constant command. Moreover, governments usually try to forbid indexing to the exchange rate in order to keep currency substitution in check as long as possible. The same qualifications apply for the direct denomination of contracts in foreign currency.

Thus, different standards evolve for different kinds of transaction: dollarisation prevails in property markets and other long-lasting assets, wage contracts and property leases are indexed, while wholesale and retail markets as well as short-term financial markets continue to trade on a nominal basis. It is obvious that an economy operating on different transaction standards cannot function without friction, especially in markets that are affected by different standards – most conspicuously in the real estate sector\(^{84}\). Real incomes become volatile because the adjustment formulae in wage contracts do not properly reflect the changes in consumer goods prices. Since long-term financing of investments is not available, investors have to make use of several succeeding short-term loans at real interest rates that oscillate between positive and negative values. The use of certain kinds of indexation does not only imply costs but also significant risks (although intended to reduce risks) that reduce people's willingness to make binding long-term commitments\(^{85}\). Thus, financial management gains more resemblance with a daily gamble than with a productivity enhancing activity.

Which contracting strategies prevail depends on the magnitude of inflation, but also on a country's institutional characteristics and its experience with inflation. Formal indexation of financial contracts\(^{86}\) or official wage adjustments based on

\(^{84}\) This was the case also in Argentina: Property markets were in Dollars but mortgages were available neither in domestic currency nor in Dollars. Leases were indexed; exchange rate movements then changed the relative prices of houses and leases, causing excess supply in one market and excess demand in the other.

\(^{85}\) A rather curious example is the Argentine "doctrina de imprevisibilidad" (unforeseeability doctrine), a law that allowed a party of an indexed contract to obtain a revision if the agreed escalator deviated by much of the actual price development. With high price volatility, however, the application of this law sometimes produced the opposite outcome, when the plaintiff was worse off with the revised contract because interim price swings undid the intended effects. See Heymann/Leijonhufvud (1995), p. 97.

\(^{86}\) This was practised in Brazil in the 1980s and early 1990s, when even overnight credits with amounts higher than the equivalent of 3,000 US-Dollars were indexed. See Bernholz (2003), p. 94.
explicit indexing formulae may be chosen by some countries, while in other economies indexation remains less widespread.

The strategies prevailing in Argentina during the 1980s were the shortening of contracting periods rather than indexing, which remained a less important practice. In the mid-1980s, with monthly inflation rates of 20 to 30 percent, wages were adjusted monthly, usually with reference to the CPI growth of the previous month, but without explicit indexation clauses. Given highly variable monthly CPI growth rates in Argentina (in the late 1980s between 2 and 200 percent), indexing was of only little use, since the real value of payments from indexed contracts got highly variable.

2.2.5.8 Disappearance of Markets

Refraining from economic transaction is another strategy to deal with immense uncertainty. In high inflations, certain markets simply disappear, as there is no way to cope with uncertainty, especially in the longer term. Long-run positions will at most be held abroad. At the end of the 1980s, Argentine "longer-term" credit markets had completely vanished, so that the longest available credits had the duration of 14 days.

The intertemporal structure of markets shrinks: the higher the inflation rate, the shorter the remaining market terms. One aspect of this phenomenon, known throughout Latin America as "cortoplacismo", is the substitution of one long-term contract by two or more successive short-term contracts: economic agents prefer flexibility and forgo higher yields in return of a smaller degree of uncertainty. As a consequence, a reduction in short-term real interest rates and even the acceptance of persistent negative real rates can be observed. Figure 17 depicts the development of nominal and real interest rates over the decade. Passive real interest rates were mostly negative, while in the years preceding the Austral stabilisation attempt, and again in 1989, even active real rates ranged far into the negative spectrum.

The shrinking volume and time dimension of the capital markets hurts the real economy. The intertemporal allocation of resources between the sectors of an

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89 See Bernholz (2003), p. 93.
90 In this environment, low short-term interest rates should not be interpreted as the result of an underestimation of the inflation rate. See Heymann/Leijonhufvud (1995), p. 52.
economy is hindered and rendered inefficient by high and erratic inflation: in a
decentralised market economy, financial institutions and capital markets work to
coordinate consumption and saving of private households with production and
investment of firms. Debt financed investment is rendered impossible when long-
term financing is not available. Therefore, under high inflation, investment activity
decreases, and the capital stock is doomed to get obsolete.

In the extreme, even retail markets are affected by “disappearance”\(^9\). This is
illustrated drastically by the view of a sign that appeared in many shops during
Argentine hyperinflation: “Closed for the lack of prices”. Needless to say that at this
point riots and anarchy are close and the state’s survival is at stake.

**Figure 17: Nominal and Real Interest Rates 1980-1990**

\(^9\) Heymann/Leijonhufvud call this refusal of retailers to sell the „option to exit“.
2.2.5.9 Economic Performance

Assuming backward-looking expectations, additional money creation is able to produce initial real effects in terms of higher output and employment, since agents – even if free of money illusion – adapt their behaviour to the higher inflation rate only with a lag. Permanent real effects can be obtained only at the cost of ever accelerating inflation.\(^\text{93}\)

With the assumption of rational expectations, there is little or no Phillips curve trade-off left between inflation and unemployment, since agents are able to perfectly predict any systematic policy action. Only unsystematic policies (surprise inflation) are able to deliver short-term effects, but are speedier adjusted to and incur high costs in terms of increased volatility and uncertainty.

That said, although moderate inflation may be able to stimulate economic performance temporarily, ongoing high rates of inflation repel that property.\(^\text{94}\) This can be explained with the observation that under high and accelerating inflation the likelihood of unanticipated monetary policy stimuli gets very small, as individuals

\(^{94}\) See Bernholz (2003), p. 102.
become “immune” to the possibility of real effects from monetary policy. High inflation destroys money’s functions to such a degree that central economic institutions lose their effectiveness. There is no doubt that high inflation economies perform less well than they would under macroeconomic stability. Still, it has to be qualified in which ways they perform less well.

The causation chain between inflation and real growth generally focuses on relative prices and lost efficiency: rising inflation increases inflation variability, and hence uncertainty. Rising inflation variability increases relative price variability, which distorts signals for producers and consumers alike. Relative price variation creates additional uncertainty. The interpretation of shifts in prices or demand – the basis for decision making – becomes guesswork, as nominal factors become indiscernible from real ones. To the extent that such guesses are wrong, fluctuations in real economic activity and an overall efficiency loss occur.

While it is empirically proven that real growth variability increases with inflation, the effect of inflation on the long-run growth rate remains unclear. Does high and variable inflation only reduce the level of factor use or might it even induce the economy to take a long-term path of slower growth because the potential factor supply itself is reduced? As far as highly uncertain real returns increase the reluctance to invest (or to supply one’s workforce), both the physical and the human capital stock and thus potential long-term growth may indeed be reduced. Possible expectations of future capital losses and/or confiscations may deter investment or re-direct it into more labour-intensive, though less productive, sectors (such as services), both of which entails a long-term decline in income and productivity. Put into the Phillips curve context, a fall in the factor supply may even lead to an inflation-unemployment trade-off sloping upwards in the long run, so that the same inflation rate now incorporates lower economic activity and higher long-term unemployment than before.

However, the relationship between inflation and long-run growth is difficult to prove, not least because it is difficult to separate the effects of high inflation on economic performance from other factors, such as other growth-inhibiting policies or external shocks, which usually are involved as well. Therefore, the microeconomic approach, i.e. the examination of the consequences of inflation for the behaviour of individuals and firms, is crucial. 

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the public and private sector, feeds the analysis of the growth-inhibiting effects of high inflation.

The above considerations on the forming of expectations in mind, several ways of how high and variable inflation affects the economic performance become stringent. First, an incoherent collective state of expectations, reflected in differing real interest rates used in individual calculations of intertemporal resource allocation, leads to an inefficient allocation of capital in general. Second, the preference of short-term contracts and the ensuing disappearance of long-term finance markets make the financing of investment difficult if impossible, at least inefficient, with the result of worsening investment yields and reduced investment activity. Third, and perhaps more damaging and lasting than one is generally aware, a general "politicising" of the economy is observed, i.e. human resources are misdirected in a way which additionally reduces economic efficiency. In a highly inflationary and erratic environment, traditional skills in production, quality control, marketing, or distribution lose their relative value against qualities that enable an individual to better cope with the instable monetary environment\textsuperscript{98}: the ability to predict monetary policy actions and to hedge against them becomes the most important human skill. The criteria for personal success change, and people such as financial experts, accountants, lawyers, and, above all, people with political connections get more valuable. Political interaction via pressure groups replaces the more productive ways of private co-operation\textsuperscript{99}.

Figure 18 shows the extreme volatility of Argentine GDP during the 1980s, with oscillations between -7.6 and +7.9 percent annual growth (both extremes reached in successive years), and a strong drift into the negative in the years up to 1989. Investment activity declined to a degree that did not suffice to maintain the existing capital stock, so that, as a consequence of high real interest rates, lacking demand, and increased importance of speculative financial activities, in fact a process of de-investment took place, boding ill for the country's long-term perspectives\textsuperscript{100}.

Unemployment grew over the decade from little more than two to 7.4 percent in 1990 (see Figure 19). The rate of underemployed persons was estimated to be at around the same proportion.

\textsuperscript{98} Indeed, banks and financial intermediaries have an incentive to expand their services and offer new money substitutes. The "physical" size of the banking sector tends to grow in high inflation.


\textsuperscript{100} See Wohlmann (1998), p. 119.
Argentina’s dismal economic performance gets perhaps most palpable in comparison with the region’s performance, as depicted in Figure 20: with the exception of the agricultural sector, hitherto the country’s growth engine which managed to grow, albeit meagrely, over the decade, the economy shrank while the rest of Latin America grew.

**Figure 18: Inflation and GDP Growth 1980-1990**

![Inflation and GDP Growth](image)

Sources: Worldbank, 2003 World Development Indicators and Oficina de la CEPAL en Buenos Aires on the basis of official data.

**Figure 19: Unemployment in Argentina 1980-1990**

![Unemployment](image)

Source: Worldbank, 2003 World Development Indicators.
2.2.5.10 **External Trade**

The effects of high and erratic inflation on trade are mixed. As pointed out, the real exchange rate tends to move towards undervaluation as a result from high and erratic inflation. This should work to discourage imports and boost exports. In addition, both the decline in domestic demand caused by high inflation and the increased incentive to earn foreign currency affect export levels positively\(^{101}\).

In Argentina, after the collapse of the Tablita in 1981, earlier attempts to reduce trade barriers reverted into an increase in protectionism, resulting in a complex import-discouraging system of tariffs, administrative controls, and special treatments. In the second half of the 1980s, following an agreement with the World Bank, tariffs were eased somewhat, their structure modified (with a maximum import tariff of 40%), and quantitative restrictions reduced\(^{102}\) (moreover, various commercial agreements were signed with Brazil, which paved the way for the later signing of the MERCOSUR treaty\(^{103}\)). This is visible in imports declining during the first half, and recovering somewhat in the second half of the 1980s, but ending up

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103 Between 1984 and 1989, 24 bilateral protocols were signed by Argentina and Brazil which regulated different areas of trade integration. In 1990, the existing bilateral agreements were systematised and intensified, and Paraguay and Uruguay joined the talks, which brought about the MERCOSUR founding treaty between the four members in early 1991. Chile and Bolivia have joined MERCOSUR as associated members.
much lower than in the beginning decade (see Figure 21). Exports as well as the overall trade balance improved significantly since 1987 which mirrors the limited recovery of the terms of trade during these years, after they had worsened massively during the first half of the 1980s (see figure 22).

**Figure 21: Foreign Trade 1980-1990**

![Graph showing foreign trade 1980-1990](image)

Source: Oficina de la CEPAL en Buenos Aires, on basis of data from MECON.

**Figure 22: Foreign Trade Prices (1986=100)**

![Graph showing foreign trade prices 1980-1990](image)

(1) Indices calculated on the basis of unit values expressed in US-Dollars.

(2) The indices correspond to the Paasche formula, i.e. they include not only the effects of price variations but also changes in the composition of trade flows.

Source: Oficina de la CEPAL en Buenos Aires, on basis of data from INDEC and other sources.
2.2.5.11 Distributional Effects of High Inflation

It has been previously stated that the incidence of the inflation tax is clearly regressive. Although people on average forcibly become financially more sophisticated in high inflation economies – at least they will be informed in detail about current monthly, weekly or even daily inflation rates, as well as about the development of different index components – the capability to minimise the exposition to the inflation tax differs significantly between the poor and the more well-to-do. Typically, the strategies to reduce real money balances for average households are restricted to building up inventories of consumer goods on paydays. Contrary to the poor, the better-off own things such as cars and freezers, or credit cards, which better enable them to avoid the holding of unwanted cash balances, or to realise more or less randomly occurring “bargains”. Moreover, they have the possibility to place the rest of their received earnings either in short-term deposits or to transfer them into foreign currency, both options often being barred for lower income people by minimum size requirements. The striving to spend all money early in the payment period entails a reduction of precautionary balances and the risks associated with it. Then, unforeseen medical expenses, for example, may hit poor households badly and necessitate big cuts in consumption afterwards.

It has been pointed out that wage indexing tends to favour lower income groups as opposed to higher wage earners, whose contracts have to be renegotiated. This may be true for moderate inflations (where, however, indexing often is not practised), and would indeed incorporate a redistribution of income towards low wage earners in the long run\textsuperscript{104}. However, as has been shown, with lasting and accelerating inflation, economic performance and employment is damaged in a way that claiming advantages for the working class from high inflation seems cynical, especially if one keeps in mind the uneven incidence of the inflation tax described above.

The distribution of wealth is affected by high inflation in a way that holders of nominal financial assets with fixed nominal returns lose much of their fortune, whereas debtors gain as the real value of their debt melts down quickly. The first group usually comprises private households who see their savings and life insurances vanish, whereas the second group is made up mostly of enterprises and the government. Owners of real capital – real estate and shares – also suffer losses

\textsuperscript{104} This is sometimes used as an argument to regard anti-inflation policies as hurting the working class.
due to its reduced revenue potential, but to a far lesser degree than owners of nominal capital. As a consequence, inflation generally works to redistribute wealth in a way that hurts the middle class – with the ensuing potentially dangerous social and political consequences\textsuperscript{105}.

Figure 23 summarises the losses in real income for different Argentine population groups. Clearly, the poorest fifth of the population suffered most from high inflation, being left in 1989 with 25\% percent of the real incomes they had disposed of in 1980. The top quintile's real incomes suffered least, ending up at 60\% of their 1980 level.

**Figure 23: Real Incomes by Population Groups, 1980=100**

<table>
<thead>
<tr>
<th>Year</th>
<th>Poorest Quintile</th>
<th>Second Quintile</th>
<th>Middle Quintile</th>
<th>Fourth Quintile</th>
<th>Top Quintile</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1986</td>
<td>89</td>
<td>94</td>
<td>89</td>
<td>95</td>
<td>86</td>
<td>91</td>
</tr>
<tr>
<td>1989</td>
<td>25</td>
<td>37</td>
<td>40</td>
<td>48</td>
<td>60</td>
<td>49</td>
</tr>
</tbody>
</table>

Source: Página 12, cited after The Economist\textsuperscript{106}.

Considering the distribution of wages among the employed, the picture gets even more accentuated: while the poorest 30\% percent lost 13\% percent in their wage share, the richest ten percent gained 23\% percent since the mid-seventies until 1991\textsuperscript{107}.

These numbers embody Argentina's striking development from one of the most "equal" Latin American countries to one of the most unequal: owing to its abundance in resources, its demographic structure (composed overwhelmingly by immigrated Europeans, and only few indigenous populations), as well as its Peronist past of pronounced social welfare, the Argentine society had been one of the most "equal" by Latin American standards until the mid-seventies. While the continuously worsening distribution since that time is generally attributed mainly to structural changes, such as massive government interventions in wage negotiations (most

\textsuperscript{105} See Bernholz (2003), pp. 107ff.
\textsuperscript{107} See Waisgrais (2003), p. 7.
accentuated during the military regime, but also practised later in the eighties)\textsuperscript{108}, there is no doubt that high inflation contributed to this development.

Accordingly, the most common measure of income distribution, the Gini index, shows a rise in income inequality among Argentine households from 0.416 in 1980 to 0.437 in 1990\textsuperscript{109}. In October 1989, more than 45% percent of people living in the Gran Buenos Aires area lived below the poverty line\textsuperscript{110}.

\subsection*{2.2.6 From High to Hyperinflation}

As already noted, the demarcation line between high and hyperinflation is, by convention, drawn at the numerical limit of 50% monthly inflation. It has also been said that high inflations can persist for long while any economy, once caught in hyperinflation, is bound to collapse within short. The course of events that eventually triggers an inflationary economy's transition into hyperinflation is not easy to establish, and certainly cannot be generalised. But the above characterisations of high inflation economies deliver some central aspects.

The state of a high inflation economy can be described as excessively sensitive: time horizons over which people are prepared to commit themselves have shortened to a few days, and prices are changed with such frequency that inflationary impulses are spread very quickly. Uncertainty and nervousness concerning economic and political developments dominate everyday life. In such an idiosyncratic state, single unforeseen, often political, events are able to push the economy over the verge\textsuperscript{111}. But the developments set in motion by high inflation may at some point well deliver the trigger on their own. E.g., once backward-looking indexing becomes unacceptable for wage earners and is replaced by forward-looking arrangements, one very important anchor that kept the economy off the shores of hyperinflation is given up, and one of the few remaining links between past and current prices is lost.

In Argentina, the double outbreak of hyperinflation in May to August 1989 and December 1989 to March 1990 was clearly connected with the collapse of two

\begin{itemize}
\item They included anything from state fixing of wages, minimum wage freezes, the suspension of trade union activities and the right to strike, to the abolition of collective bargaining. See Waisgrais (2003), p. 14.
\item See Altimir/Beccaria (2000a), p. 432.
\item See Heymann/Kosacoff (2000), pp. 32f.
\item For instance, in the case of German hyperinflation, it was the assassination of Rathenau in 1922 that led to hyperinflation within short.
\end{itemize}
stabilisation attempts. “Plan Primavera” was given up after 8 months in early 1989. “Plan BB”, introduced in July 1989, was even more short lived, and from mid-December hyperinflation was back again. In both cases, the inflation rate jumped from single-digit monthly figures to more than 50% within a few weeks.

While most of the setting in which both bouts of hyperinflation occurred is identical, there is one major difference. The degree of financial adaptation to hyperinflation, and especially the degree of dollarisation, increased during and after the first hyperinflation of mid-1989. The second bout of hyperinflation therefore met a better prepared public with more alternative monetary assets in place. It can be argued that this is the cause why monthly inflation reached 200 percent during the first, but “only” 100 percent during the second hyperinflation: the rate of inflation required to induce people to hold less money was reduced by the process of financial adaptation and/or dollarisation 112.

The depiction of hyperinflation differs from that of high inflation mainly in the degree of extremity. Plans have to be recalculated from day to day, even from hour to hour. The simplest transaction, like selling a product, becomes highly risky. These risks are reflected in ever higher mark-ups on production or restocking costs (with massive discounts offered for payment in foreign currency), or, on the limit, in the refusal to trade at all. Widespread shortages arise spontaneously, owing to the excessively delicate state of expectations of market participants.

Dollarisation gets ever more widespread and eventually dominates almost all markets – except retail markets for non-durable goods, which usually continue to be fed out of wages or government transfers paid in domestic currency. The exchange rate becomes the common reference for price setting, although being itself highly volatile 113. Money demand falls drastically; in addition, unpredictable monetary policy injections, incoherent expectations and highly variable transaction volumes render money demand extremely volatile, which feeds back on goods and exchange


113 Heymann/Leijonhufvud describe practices that emerged during Argentina’s hyperinflation in inter-company relations. Mostly, goods were ordered without knowledge of the price, the latter being communicated only upon delivery. Another method was to determine the price as the equivalent of the Dollar price in domestic money at the moment when the contract was agreed upon; the buyer paid an amount calculated on the basis of the exchange rate prevailing at the moment of payment, and the seller recalculated the price using the exchange rate at the time of crediting the bill, so that, finally, the buyer issued a second cheque for the difference between the amount paid and the final price. See Heymann/Leijonhufvud (1995), p. 107.
markets. Nominal, real, and relative prices fluctuate widely all over the economy. Trade and consumer credit disappear completely, and so do the incentives to supply goods or effort to the markets. Real activity declines sharply, and unemployment rises. The operation of the state itself becomes impossible, as all sources of government finance peter out. Once caught in hyperinflation, there is no "soft" way back, and any stabilisation attempt has to work instantaneously and rigorously.

2.3 Options for Stabilisation in the beginning 1990s

2.3.1 Political Feasibility of Reforms

"Each case history [of high and hyperinflations] is a story of repeated attempts to cut the deficit. But in most cases it is as if a succession of failed attempts is necessary before a coalition can finally be formed to put into place a realistic stabilisation package. The commonly shared recognition that systematic taxation is collectively preferable to continued inflation does not by itself produce agreement on the concrete steps that could stabilise the public finances."\(^{114}\)

The situation of an economy caught in hyperinflation offers no gradual way back to stability. The public has lost any confidence in the domestic money, inflation rates have reached exorbitant levels, and it does not matter any longer whether inflation expectations miss the actual developments by umpteen points since domestic money is nearly completely substituted by stable money even in cash transactions. The real stock of domestic money has fallen drastically, and inflation tax revenues dwindled to a negligible level. Other government revenues continue to fall as well due to the Tanzi effect and decreasing economic performance. At the same time, government expenditures have to rise to grant transfers to the increasing hoards of unemployed. The government is in danger of losing its authority.

In this situation, the economic conditions eventually make drastic reform efforts not only inevitable but also politically feasible. Since all other measures to revive the faltering economy now would immediately vaporise without effect, the proposal of a monetary reform will finally be able to gain majorities\(^{115}\).

The case of Argentina, however, proved to be quite peculiar in this respect. Clearly, the second-to-last failed stabilisation attempt and the culmination of

\(^{115}\) See Bernholz (2003), p. 163.
decades of monetary instability into hyperinflation dominated the presidential election campaigns of 1989 and led to a clear victory of Carlos Menem\textsuperscript{116}, who amidst food riots and hyperinflation took over the presidency five months early, in July of that year (when monthly inflation soared to 197 percent). However, in his campaign, he had publicly promised to pursue the purest of Peronism (which never had lost its popularity and had gained support among the working class the more high inflation had disadvantaged them), vowing to increase wages and to re-open bankrupt factories\textsuperscript{117}. At the same time, he had sought the support of business and the middle class with his strategically vague promises to fight inflation\textsuperscript{118}. However, Menem, soon after his election, removed the Peronist robe and turned to the free-market approach of his defeated competitor, adopting a rigid orthodox stabilisation plan with the currency board as its cornerstone.

2.3.2 Shape of Reforms Ending Hyperinflation

The measures necessary to end hyperinflation have to tackle its main causes and some of its detrimental effects. Crucial are a stop in money creation to finance budget deficits, the restoration of confidence in the national money, and the re-establishment of the real stock of national money. Given the difficulty of this task under the conditions of hyperinflation, and its extreme dependence upon the programme's credibility, it seems inevitable that the basic monetary and political institutions be exchanged and a new, credible, monetary and fiscal regime installed.

Still, any programme, credible and well-defined though it may be, cannot predetermine the stabilisation process in every respect but has to remain as flexible as to allow for adequate responses to unforeseen developments, e.g. with respect to the speed of adaptation of the public's inflation expectations. Thus, policymakers face a trade-off between strong commitments to gain credibility, on the one hand, and a certain necessary, but potentially trust-reducing, "room for manoeuvre", on the other. In addition, while there is a more or less standard menu of measures that constitute the necessary conditions for successful stabilisation, the set of actions that complements them remains to a large extent historically contingent, i.e., for each specific case a combination and sequence of steps has to be found that grants

\textsuperscript{116} This was the first time in Argentina's history that a democratically elected president from one political party took over from a democratically elected president from another political party.


\textsuperscript{118} See Pastor/Wise (1999), p. 479.
enough credibility as well as political and social acceptance. Thus, there is no standard stabilisation programme with a built-in guarantee for success.

2.3.2.1 Monetary and Fiscal Reform

As mentioned, there are two key points of reforms that are necessary to end hyperinflations. First, an independent monetary authority has to be created, with a legally or constitutionally limited amount of credit allowed to be granted to the government. Second, the real stock of money has to be increased back to its normal level.

Achieving an increase of the real money stock via a fall in the price level at a constant nominal money stock would entail a severe recession and further employment losses. As this seems politically and socially unfeasible, the other road should to be taken: an adequate growth in the nominal money stock at constant, or very slowly rising, prices. Not surprisingly, putting the brake on prices forms the most difficult part: inflationary expectations have to be removed as far and quickly as possible, which can be achieved only when the reform is credible.

To gain credibility, in most cases a set of new institutions is necessary, including a new government overseeing the reforms, a new central bank under new leadership, and (possibly) a new currency unit. In other words, new policy, fiscal, and monetary regimes have to be installed and function as institutional safeguards of the reforms. Moulding these institutional changes in laws or include them into the constitution enforces their credibility.

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120 Végh argues that credibility is easier to obtain for hyperinflation stabilisation than when trying to stabilise lower, chronic, inflation economies. First, in hyperinflations, budget deficits and the government's need for seigniorage get more engraved in people's minds as the main motor of inflation than is the case during lasting, albeit high, inflations. Therefore, they are more easily convinced that a fiscal reform at the centre of a stabilisation programme is sufficient to halt inflation. Second, the sheer extremity of the situation and the obviousness that it cannot go on deliver an inherently higher degree of credibility to any stabilisation effort in hyperinflations – more than during chronic inflations where people have learned to live with the situation. See Végh (1995), pp. 62f.
121 Bernholz (2003) stresses that these institutional safeguards can, from an historical perspective, not be unconditionally qualified as necessary ingredients of successful currency reforms, since there are rare cases of reforms that succeeded without these. Nevertheless, those reforms suffered from lower credibility. Accordingly, real interest rates remained relatively high after the reforms, which damaged economic recovery and resulted in a retarded defeat of inflation. See Bernholz (2003), pp. 166ff.
In addition to these institutional safeguards, some accompanying measures may be necessary to make the reform feasible or more acceptable in economic, political, or social terms. Although, over time, the recovering money demand will start to offset the loss of inflation tax, and real tax revenues will rise due to the Tanzi effect in reverse, the government will initially remain cash constrained. To bring down the interest burden, domestic and/or foreign debt may need reduction, e.g. via temporary moratoria on capital or interest payments (but with an eye on maintaining future creditworthiness), or via renegotiation of debts or reparations. If obtainable, a foreign bridging loan may cover interim balance of payments and budget deficits. The privatisation of public companies can relieve budgetary pressures and, if carried through sensibly, offer additional gains, such as enhanced industrial competition and effectiveness, as well as political support for the government through the demonstration of its commitment to more market-oriented policies. Finally, social acceptance of the reforms can be increased by partly redressing the uneven distribution effects of high inflation, notably by revaluing private long-term credits that lost their real value during inflation. Existing exchange controls and protectionist obstacles should be gradually removed in order to restore confidence in the competitiveness of the (new) national currency.

Obviously, initial disinflation has to be consolidated into lasting stabilisation, which is why these mentioned one-shot measures are not sufficient to restore confidence but have to be followed by comprehensive fiscal reforms that restore viable public finances.

2.3.2.2 External Anchor: Fixing the Exchange Rate

The necessary monetary and fiscal reform can be strengthened by the adoption of a fixed exchange rate regime. A fixed exchange rate to a stable anchor currency may add to, or even replace, the creation of an independent central bank – in the latter case by introducing a currency board regime.

The uneven distribution effects of disinflation itself may also need redressing. A possibility is to enforce schedules that depreciate all payments contracted before disinflation on the basis of high inflation expectations, and hence undo unwanted revaluations of real debts caused by sudden disinflation (this was done, e.g., during the Argentine “Austral” programme in 1985). In the wake of hyperinflation, however, longer-term contracts based on explicit inflation rates are virtually absent, so that these redistribution effects do not occur (this being one reason why the stabilisation costs are comparatively lower for hyperinflation than for moderate or chronic inflation economies). See Heymann/Leijonhufvud (1995), p. 123.
For a hyperinflation economy, adopting an external anchor is clearly superior to the alternative of an internal anchor, such as a monetary or inflation target. First, the high degree of dollarisation in a hyperinflation economy, where virtually all prices are indexed to, or quoted in, Dollars, means that stabilising the exchange rate is tantamount to stabilising the price level\. The exchange rate thus provides a much more direct and immediate link to prices than any monetary target, and as close a link as an inflation target. Second, given the higher transparency of an exchange rate target, and hence the higher potential immediate reputation costs of deviating from it, anchoring the national currency to a stable foreign currency will always be furnished with potentially more inherent credibility than a monetary growth, but also a direct inflation target. Of course, this potential has to be exploited by institutionally safeguarding that the government cannot change the rate at its discretion, or create devaluation pressures by continuing to monetise budget deficits. In contrast, a simple self-commitment of the government to a certain monetary growth or inflation rate while floating (purely or managed) the exchange rate will comparatively lack confidence and thus prevent inflation expectations from declining quickly. The restoration of the real money stock will therefore be, at least temporarily, hindered by both ongoing inflation and the restricted rise in the nominal money stock which challenges the whole stabilisation effort.

This finding seems to be confirmed empirically: all of the most successful currency reforms following hyperinflations in history included fixed exchange rates to stable currencies or gold parities, whereas most of the least successful reforms did not.\(^2\)

Clearly, the adoption of a fixed exchange rate, like any tight monetary rule, entails renounced flexibility and hence potentially higher costs incurred in the case of shocks which cannot be encountered by the discretionary use of monetary policy instruments. These costs are, at least in the medium term (until the necessary reputation of the authorities has been built up and can step in to allow for an easing of the rules), unavoidable and form perhaps the worst long-term legacy of high and hyperinflation.\(^3\)

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\(^1\) See Végh (1995), p. 44.
2.3.3 Argentina’s Choice

Argentina’s decades-long history of high inflation (which was shared by most of the rest of Latin America during the 1970s and 1980s) represented an extreme legacy for the designers of reform in 1990. Whereas most of Argentina’s neighbours sooner or later had managed to stabilise their economies (Chile in 1978, Bolivia in 1985, Mexico in 1987126), Argentina had only seen one failing reform after the other. Thus, whatever the shape of the announced reform, it would inescapably have to cope with a very low probability of success attached to it in the minds of the public. Thus, even defenders of exchange rate flexibility conceded that Argentina, with this legacy and the extreme credibility problem associated with it, had no other option left than resorting to a fully institutionalised mechanism of money issue127.

The new government under Carlos Menem, having taken over in summer 1989 and, first of all, having to cope with the failure of another sloppy stabilisation attempt (Plan BB), rightly felt that the answer to the ensuing second bout of hyperinflation in 1990 needed to be final. Political survival now could only be brought about by seizing the most credible and lasting stabilisation option possible. Tying the own hands by strict monetary and fiscal rules seemed the only alternative left should the country be prevented from sinking completely into chaos128.

In January, 1991, the man to accomplish this, Domingo Cavallo, was appointed as economics minister. The “father of Convertibility”, as he was later dubbed, soon launched the CBA. It entered into force on April 1st, 1991, and established the ratio 10,000 Australes = 1 US-Dollar as the legally fixed exchange rate. Though the Banco Central de la República Argentina kept its name and formal status as a central bank, its executives were replaced and its powers massively restricted, in effect reducing its functions almost completely to those of a currency board: issuing domestic currency against foreign exchange. Money creation other than in exchange for existing Dollar reserves was ruled out by law. Finally, on January 1st, 1992, the Austral was replaced by a new currency unit, the Peso, at the ratio 10,000 Austral = 1 Peso, thereby establishing the simple and popular Peso-Dollar parity129.

129 The legal and institutional configuration of the CBA will be described in detail in section 4.
Thus, although undertaken in various steps, the Argentine reform included all possible institutional cornerstones\textsuperscript{130}. The crucial element of these was the choice of the strictest possible anchoring of the national currency, the adoption of the CBA.

Without anticipating the detailed analysis and interpretation of Argentina's economic performance following the stabilisation via currency board (see section 4), some central features characterising its success shall be mentioned here. Annual inflation rates decreased to 84 percent in 1991, to 17.5 percent in 1992, and to 7.4 percent in 1993, only to decline in the following years to less than one percent. The real stock of national money rose from its minimum in February 1990 of 15 percent of its "normal" level to 41 percent in mid-1992 and 44 percent in March 1993\textsuperscript{131}. The still comparatively low level of the real money stock two years after the reforms, with inflation rates as low as the country had not experienced since more than a decade, reflects the fact that the high degree of currency substitution built up during the years of high and hyperinflation got reversed only to a limited degree. This is, on the one hand, probably due to an initial mistrust in the reforms, but is, on the other hand, also a consequence of the almost unrestricted acceptance of Dollars throughout the economy, as well as of the handy 1:1 exchange rate. The latter argument is strengthened by the fact that real interest rates were relatively low in the early 1990s, i.e. confidence in the reforms cannot have been as persistently low as to drive interest rates up\textsuperscript{132}.

The output costs of stabilisation itself seem to have been small. Positive output growth resumed in 1991, with real GDP growing by 10.6 percent in that year, and with continuing strong growth in the following years, averaging 5.8 percent between 1991 and 1998\textsuperscript{133}. This corresponds with the often observed fact regarding the

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\textsuperscript{130} Of course, the fact that the institutional changes were not introduced at a stroke retarded the defeat of inflation in Argentina. This is the reason why Bernholz (2003) counts Argentina to the group of "less successful currency reforms": it missed the defined criterion for the group of "most successful reforms" - annual inflation below 25 percent in the year after the reforms – for the year 1991, but met it in 1992. See Bernholz (2003), p. 186.

\textsuperscript{131} Bernholz (2003) defines the normal real stock of money as "its size in the year before the inflation began or when it had been very moderate", see Bernholz (2003), p. 75. It has to remain open exactly which level he defined as "normal" for the Argentine case.

\textsuperscript{132} The active rate applied on discount of documents for 30 days was 22.4 percent in 1993, which results in a real rate of 15.4 percent for that year. See Heymann (2000), p. 176.

stabilisation of hyperinflations, namely that output costs are small relative to the costs that are incurred when stopping lower inflations\textsuperscript{134}.

In accordance with this finding, Argentina's unemployment rate did not rise in the immediate follow-up of stabilisation. Unemployment in the Gran Buenos Aires Area declined from 7.3 percent in 1990 to 5.8 percent in 1991, then rose slightly to a level still lower than during hyperinflation (6.7 percent in 1992), and kept on growing only in the following years. This retarded rise cannot be ascribed to stabilisation itself, but was mainly the effect of corresponding reforms, which included the opening of the economy as well as a massive privatisation programme that lay off the massive proportion of unproductive employment in the public sector, built up since the days of Perón.

\textsuperscript{134} Végh demonstrates this with a simple model of a fully credible exchange rate-based stabilisation programme, and gives proof by examining historical cases. The reason for output costs being virtually zero in the case of a fully credible exchange rate-based stabilisation programme, in his model, is that, in a hyperinflation economy, everyone acts in a forward-looking manner, i.e. credibly changed conditions are immediately reflected in prices, with the effect that inflation is reduced abruptly at no real cost. See Végh (1995), pp. 43 ff. Ireland to some extent supplements this by stressing the role of fixed costs of price adjustments: high and hyperinflation stabilisation requires initial big changes of nominal prices – big enough to outweigh fixed costs of price adjustments. Hence, sticky prices pose no obstacle to immediate hyperinflation stabilisation – in contrast to low inflation stabilisation, where fixed costs prevent agents to immediately reflect small steps of disinflation in their prices, and so are responsible for real costs of disinflation. See Ireland (1997), as well as the comments delivered by Sargent (1997) and Blanchard (1997).