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Bulgaria's Hyperinflation in 1997: Transition, Banking Fragility, and Foreign Exchange

Sébastien CHARLES
Université Paris 8, LED
sebcharles92@yahoo.fr

Jonathan MARIE
Université Paris 13, Sorbonne Paris Cité, CEPN
jonathan.marie@univ-paris13.fr

Abstract

This article has two objectives: to study the 1997 episode of hyperinflation in Bulgaria, and to compare and contrast this analysis with the post-Keynesian theoretical approach. This approach highlights the role of three components observed simultaneously in order to understand the emergence of hyperinflation: a virulent distributive conflict; the presence of indexing mechanisms; and finally flight from domestic currency into one or more foreign currencies. The article reveals that a transitional economy like that of Bulgaria in the 1990s may generate hyperinflation in the absence of any violent distribution conflict: the transition and the banking crisis engender inflation. The foreign exchange rate is decisive in the emergence of hyperinflationary dynamics (and therefore mistrust of domestic currency). This interpretation of hyperinflation is confirmed by an econometric analysis.

Key words: hyperinflation, foreign exchange, transition, Bulgaria

JEL codes: C12, E12, E31, P22

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1. Introduction

This article pursues two objectives. The first is to study an episode of hyperinflation in the context of a transitional economy. In February 1997, Bulgaria experienced an episode of hyperinflation at the same time as a banking and budgetary crisis. These last two aspects are generally at the centre of existing analyses; we focus instead on understanding and analysing the hyperinflation. The second objective is a theoretical one. The purpose is to compare and contrast Bulgaria's hyperinflation within the framework of post-Keynesian analysis. This comparison should make it possible both to confirm that the framework of analysis is robust and possibly to suggest further developments or amendments.

Beyond the strictly empirical analysis, it seems logical to us to look into this episode on the basis of a theoretical proposition developed around the case of Argentinian hyperinflation in 1989 (see Marie, 2014). The analogy is all the more natural because the Argentinian hyperinflation, like the Bulgarian case, resulted in the adoption of a currency board (CB).¹ In both instances, once the new monetary regime was adopted, the inflationary rhythms were largely dampened and the chances of a new hyperinflationary episode occurring faded. This work also takes up the proposition to model hyperinflation for a small open economy with a fixed foreign exchange rate (Charles and Marie, 2016).

The article is organised as follows. In the next section, we propose a definition of hyperinflation. This definition offers a qualitative characterization of hyperinflation and highlights the key role played by distributive conflict, indexation, and the flight from domestic money into a foreign currency. In the third section, we present the chronological sequence observed in Bulgaria, beginning with the 1989 transition and that led to the hyperinflation of 1997. On the basis of stylized facts we show that the theoretical sequence revealed earlier does not correspond with the Bulgarian case. The fourth section proposes an amended theoretical sequence through which to understand the emergence of hyperinflation in a transitional economy. Section 5 seeks to confirm our propositions via a few econometric tests. A final section brings together our conclusions.

2. The post-Keynesian interpretation of hyperinflation: distributive conflict, indexation, and the flight from domestic currency

Our definition of hyperinflation goes beyond the traditional quantitative vision of Cagan (1956) and provides an understanding of its origins. It is part of a double tradition. First it includes the role of the balance of payments dynamic, a factor at the heart of the analysis of 1923 German hyperinflation proposed by Karl Helfferich (cf., Câmara and Vernengo, 2001). Here, outflows of domestic capital caused by reparations for war or financial charges due to massive foreign debt imposed constraints on foreign exchange causing external depreciation of domestic money and fuelling inflation. Secondly, post-Keynesian theory rests upon the distributive conflict and its development to explain inflationary dynamics. This connection between the distributive conflict and inflation was revealed by Aujac (1950) and Kalecki (1954). Inflation is the result of conflicting interests among social groups which, in seeking to acquire a greater share of national income, cause prices to rise. If, as we propose, hyperinflation is different in nature from inflation, hyperinflation develops in the context of high inflation.

¹ The CB is defined by three factors that are observed simultaneously: the foreign exchange rate is fixed, the unrestricted convertibility of domestic monetary units into foreign currencies is possible at any time, and it must constantly be checked that the monetary base is fully covered by foreign exchange reserves.

2.1 Distributive conflict as the driving force behind inflation

Within post-Keynesian theory, inflation reflects the existence of a distributive conflict and is generated in a given institutional and historical context. Along lines first developed by Rowthorn (1977), post-Keynesian authors have sought to develop models to explain inflation.

The general price level is determined by costs, which are borne by capitalists. The principal determinant of these costs is the cost of wages. Firms apply a mark-up to this cost in order to determine prices (Weintraub, 1978). A price variation occurs if the mark-up varies, if labour productivity changes, or if the nominal wage varies. This is how the distributive conflict intervenes in the inflationary process: all groups seek to secure the most favourable distribution of income for themselves. Wage labourers seek to do this by securing higher wages; capitalists by increasing their profits via price rises. A group's ability to achieve its objective depends on its bargaining power. Wage labourers may enjoy substantial bargaining power, among other examples, if unemployment in the economy in question is low (Rowthorn, 1977), if unemployment is falling (Casetti, 2003). The bargaining power also depends on the type of union organizations (Susjan and Lah, 1997), or on the institutional framework (Setterfield, 2007).

Capitalists' market power is positively affected by the existence of oligopolistic markets or by the rate of use of capital (if they are in a situation where capital is under-used, firms tend to increase output rather than prices further to a rise in demand). In Rowthorn's founding model, workers negotiate a nominal wage for the following period. Then firms fix prices, seeking to achieve the price level compatible with the desired mark-up. The rate of inflation is then the consequence of divergences between the objectives of firms (the mark-up aimed for) and of workers (the real wage sought). In the final resort, firms fix prices. They increase them when the actual mark-up is less than the desired mark-up. Thus, a mark-up target can be analysed as a real wage target. In other words in order to increase the mark-up, firms must successfully reduce real wages.

While the remuneration of labour is an important factor for firms' costs, there are others. And when these costs vary, mark-ups are affected. Entrepreneurs may therefore attempt to pass on an increase in their non-wage costs to the real remuneration of workers. The impact of a variation in interest rates on the process of negotiation of wages and prices was emphasized by Galbraith (1957). If interest rates rise, firms will seek to pass on this rise in their financial costs via a price rise. The reasoning is valid, of course, if we consider changes in the prices of firms' inputs or changes in the foreign exchange rate of the domestic currency. So exchange rate pass-through is explained as follows (see, for example, Arestis and Milberg, 1994): depreciation of the domestic currency will affect firms' profitability because imported inputs (or investment goods), the prices of which are in foreign currencies, come at a price expressed in the domestic currency, which is rising. Firms will then seek to counter this trend by raising prices.

2.2 Indexation mechanisms develop in high inflationary regimes

An economy's inflation rates may be persistently high. This kind of situation was to be observed, for example, in developed countries in the 1970s but also and above all in many Latin American countries until the late 1980s. During this period, neo-structuralist authors were to take a particular interest in the institutional mechanisms that increase or maintain an inflationary trajectory. These authors explain that agents' behaviour will change when they come to understand that inflation may vary suddenly, when it is habitually high, or when it tends to rise. It is essential to include this factor in our thinking. Frankel (1979) reveals the importance of indexation in high inflation regimes. He explains that if inflation is high and volatile over several periods, agents will seek to develop indexation mechanisms to protect their real incomes

against the effects caused by a possible acceleration of inflation. This institutional mechanism naturally maintains inflation, but it may also accelerate it (see also Taylor, 2004).

Indexation phenomena add to the distributive conflict, making it difficult for a stable and low inflationary compromise to emerge over the share-out of value-added. Carvalho (1991) distinguishes between the moderate- and the high-inflation regimes by using the indexation criterion. He considers that annual inflation of close to 20% requires indexation mechanisms to be created. As the author acknowledges, indexation creates its own vulnerabilities, notably in propagating bursts of inflation.

2.3 Hyperinflation: the flight from domestic currency -- the final stage in a causal sequence

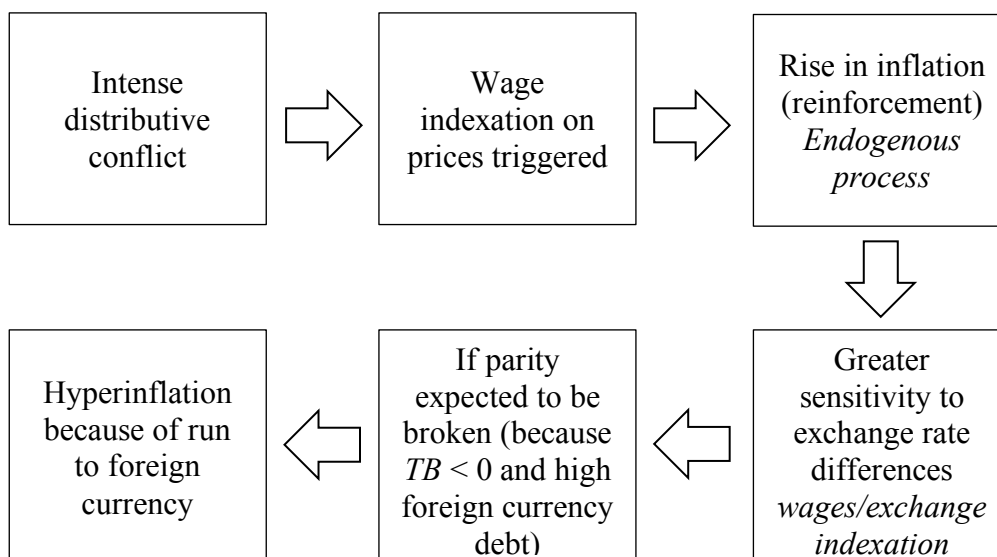
The post-Keynesian analysis of hyperinflation was initiated by Kalecki (1962), who sees acceleration in the speed of circulation of money as the cause of the acceleration of prices. This acceleration of prices is brought about by the expected inflation rate. According to Kalecki, hyperinflation in a closed economy is a rapid and continuous rise in prices and the general tendency to convert money into goods. It is a flight from money, the rate of circulation of which accelerates. These two factors are inseparable. Kalecki reveals other important characteristics of hyperinflationary episodes. They go hand-in-hand with situations of shortages in the supply of goods, impoverishment of *rentiers*, and reductions in real wages, which, although they may benefit from inflation-indexing mechanisms, are penalized by the existence of adjustment lags. This means that only the profits of entrepreneurs, and above all those made by big business, thrive. Kalecki's contribution is important in two ways. It highlights a qualitative aspect of hyperinflation: people abandon the use of means of payment as quickly as possible because they expect inflation to continue rising. But his contribution also emphasizes the consequences for distribution.

If this proposition is put together with that of Robinson (1951), the construction of the post-Keynesian view of hyperinflation can be completed. Robinson looks into the sequence of events leading to German hyperinflation in the early 1920s.² Unlike Kalecki, she considers an open economy. She highlights the following sequence of events: inflation is initially high, caused by a virulent distributive conflict. Domestic inflation causes a downturn in the balance of trade. This downturn brings about a decline in the direct exchange rate of domestic money, which raises the price of imported goods expressed in domestic currency. The German economy at the time faced crippling foreign currency debt (as a consequence of the Treaty of Versailles). This mechanism feeds new price rises (firms want to maintain their mark-ups) and wage rises (workers want to maintain their real level of remuneration). For Robinson the collapse of foreign exchange led to hyperinflation. This analysis is part of the same lineage as Helfferich's.

Our view of hyperinflation therefore takes the following form: hyperinflation is a phenomenon that is first caused by a violent distributive conflict. This conflict favours the adoption of indexation mechanisms, including on foreign exchange. Inflation is incompatible with external equilibria and the external depreciation of money feeds back into the price-wage loop. This is the sequence Robinson describes. If we add the role played by expectation, which Kalecki emphasizes, hyperinflation occurs when agents, anticipating the break-off in foreign exchange, turn away from the domestic currency and towards some substitute: foreign currency. This triggers a self-fulfilling phenomenon that entails the break-off of foreign exchange and any coherence provided by prices in domestic currency. This analysis is consistent with work proposed by neo-structuralists on the high inflation rates observed in Latin America in the 1980s. It also corroborates the remark made by Kaldor (1982) about the German situation in 1923: if

² The article was first published as a shorter version in 1938. It was a critique of *The Economics of Inflation* by Bresciani-Turroni (1968, first English edition 1931). That book analysed German hyperinflation in a thoroughly monetarist view, an interpretation that Robinson eschewed.

foreign exchange remains stable during the day, prices and wages do too. Ultimately hyperinflation is defined quantitatively: it is the phenomenon in a highly inflationary economy that attests to the generalized rejection of domestic currency in favour of a foreign currency. Finally, our generic sequence can be depicted like this:



N.B.: *TB* is the acronym for Trade Balance in our sequence

It integrates the driving role played by distributive conflict in inflation, the importance of indexation, and the importance of the foreign exchange rate in hyperinflation. We can take away from these considerations that, in the absence of any external debt in foreign currency, in the absence of price- and wage-indexing mechanisms, and in the absence of any distribution conflict, the terms of which may trigger high inflation, there is no cause to fear the emergence of a hyperinflationary phenomenon.

3. On the transition to hyperinflation in Bulgaria

3.1 Economic fragility before the onset of the post-socialist transition

Bulgaria entered into the post-socialist transitional phase late in 1989. On 17 November the President of the State Council of the Popular Republic of Bulgaria, Todor Jivkov, was overthrown by reformist Communists. On 15 January 1990 the monopoly of the Bulgarian Communist Party was rescinded. In June 1990 the first free, multi-party, legislative elections were held, and in July 1991 the country developed a new constitution marking its exit from the Council for Mutual Economic Assistance (CMEA or Comecon). Fresh legislative elections were organized in October 1991.

The change that Bulgaria underwent was especially sudden because the country was particularly close to the USSR. First politically: Jivkov, who led Bulgaria for 35 years, was known for systematically aligning his policy with that of Moscow (at least before *perestroika*, which he openly dismissed to the point just before his resignation). But Bulgaria was also particularly tied to the USSR economically: in the late 1980s, more than 50% of Bulgarian foreign trade was with the USSR, a record among all the CMEA countries (Dobrinisky, 2000). A further indication of this type (BNB, 1990, p. 73) was that the share of Bulgarian exports to

socialist countries rose from 61.9% to 68.9% between 1980 and 1989, while the share of imports from “developed and industrialized” countries rose over the same period from 23.3% to 32.2%. This indicator reflects the fragility of Bulgarian productive structure on the eve of the collapse of the socialist bloc. Bulgaria was more dependent on outlets to socialist countries and imports from developed countries on the eve of the eastern bloc’s collapse. In addition, Bulgaria’s foreign trade prospects were diminished by the armed conflicts in the former Yugoslavia from 1991 onwards. The UN imposed increasingly strict trade blockades from 1991 to 1993, which impeded Bulgaria’s access to Western European markets by cutting off the most direct and fastest trade routes (BNB, 1993, p. 32).

Dobrinsky (2000) indicates that Bulgaria saw its terms of trade substantially deteriorate during the 1970s and 1980s, causing its foreign debt to more than triple (from \$2.9 billion in 1984 to \$10.7 billion in 1989). From March 1990 the Bulgarian government adopted a moratorium on the payment of its foreign debt. Poirot (2003) claims that this decision explains why Bulgaria received no effective support from the IMF or the World Bank. The same author also underscores the slowdown in economic growth in the 1980s and the decline in productive investment that led to insufficient capacity in the production of consumer goods. The mismatch between domestic productive supply and the development of consumption became very apparent in 1992: while consumption rose by more than 12% in that year, imports rose by 25% (see Table 1 below).

3.2 Poor macroeconomic performance and the influence of monetary policy

Economic reform began in 1991 with the adoption of a stabilization programme. Prices were deregulated, planning was abandoned, free entry onto markets was sought after, as was the liberalization of foreign trade. Dobrinsky (2000, p. 583) reports that Bulgaria adopted a strategy of a floating exchange-rate with the stabilization of the monetary base. This strategy was akin to those adopted under structural adjustment plans negotiated with the IMF by other economies in the same period (a standard set of recommendations under the Washington Consensus), although the IMF did not intervene in Bulgaria at this time. Because Bulgaria was excluded from international financial markets, the authorities maintained foreign exchange controls.

These reforms did not place the Bulgarian economy on the road to catch-up, as was to be attested by the macroeconomic indicators. On the contrary, macroeconomic performance was particularly poor. Poirot (2003) estimates that GDP declined by 16.7% in 1991. This recession continued in 1992 and 1993 as shown in Table 1. Another noteworthy factor was that although GDP plummeted in 1992 and 1993, consumption growth rates were very high (more than 12% in 1992 and more than 10% in 1993). This upturn in consumption was made possible by a large fall in Bulgarians’ gross savings (Table 3), which fell (in real terms) by over 70% between 1991 and 1993. The change in gross savings explains the change in consumption; we estimate that household consumption rose by 47 million Lev (2005) from 1991 to 1993, while gross savings fell by 46 million Lev against this background of falling GDP. Plainly the upturn in consumption was unsustainable.

Table 1 also shows the marked decline in investment from 1992 to 1994³ and the systematic downturn in public spending over the whole of the period. The fall was significant in 1993 and continued year after year. This reduction in public spending contributed 1.7% of the total reduction in GDP in 1993 (cf. line G of contributions to growth).⁴ The year 1993 was specifically marked by the downturn in exports in a difficult international context marked by

³ Even if for 1994 the downturn in investment was actually caused by a collapse of stocks.

⁴ This casts doubt on the plausibility of a hyperinflationary phenomenon supposedly caused by particularly lax public spending, a hypothesis that we do not try to check in this article.

the trade blockade of the former Yugoslavia referred to above, but also economic difficulties caused by monetary turmoil in Western Europe, and the real appreciation of the Bulgarian domestic currency (the variation in the exchange rate was lower than the rate of inflation). From that time on, the central bank sought to limit exchange rate fluctuations. It should be noted that slightly positive growth rates were observed in 1994 and 1995. These were made possible by a sharp increase in exports in 1994 and by increased investment in 1995.

Table 1. Rate of growth of GDP, components of demand, and contributors to growth, 1992-1997

	1992	1993	1994	1995	1996	1997
GDP growth rate	-7.25	-1.48	1.82	2.86	-9.40	-5.58
Growth rate (%) of:						
C	12.48	10.35	2.59	-1.82	-4.45	-7.53
I	-18.40	-24.30	-37.40	71.40	-53.00	14.90
G	-0.91	-8.66	-7.16	-8.65	-29.14	-0.75
X	0.56	-20.12	20.06	1.97	12.44	-0.76
IM	25.31	-14.73	1.50	4.16	-2.03	1.33
Contributions to GDP growth rate (%):						
C	6.75	6.79	1.90	-1.35	-3.14	-5.61
I	-4.15	-4.83	-5.72	6.71	-8.30	1.21
G	-0.17	-1.76	-1.35	-1.49	-4.45	-0.09
X	0.24	-9.48	7.67	0.89	5.56	-0.42
IM	9.92	-7.80	0.69	1.90	-0.94	0.67
(X - IM)	-9.68	-1.68	6.98	-1.01	6.5	-1.09

Sources: IMF and BNB; authors' calculations. Real data were estimated using the GDP deflator provided by BNB (2005 = 100)

N.B.: Line I includes variations in stocks, which may lead to surprising results: in 1994, investments fell by 37.4% as inventory melted away because of economic growth, while corporate purchases of goods by way of investment rose by 8.2%. Conversely, in 1995, stocks clearly built up again, which, in accounting terms, boosted the measure of total investment.

Table 2. Nominal growth rates (%)

	1991	1992	1993	1994	1995	1996	1997*
Wages (public sector)	184.6	54.0	59.7	59.2	41.5	285.3	502.5
CPI	429.3	83.1	59.1	125.1	31.1	489.0	334.9
Foreign exchange rate	727.1	7.4	42.0	83.5	10.8	1283.2	73.8

Sources: IMF and BNG; authors' calculations

N.B.: all calculations made using data as of 1 January. The nominal growth rate of public sector wages for 1991 was calculated as: (wages as of 1 January 1992 - wages as of 1 January 1991)/wages as of 1 January 1991×100. The growth rate of the foreign exchange rate is calculated from the indirect foreign exchange rate at the end of the month.

*For 1997: calculation made over 11 months with data for December 1997/January 1997.

It should be remembered that our concern is to understand price dynamics. Table 2 reveals that inflation, estimated from changes in the consumer price index (CPI), was very high from 1991 onwards. It dipped in 1992 and 1993. For 1992, inflation peaked in May: while average monthly inflation over the year was about 5%, it stood at 11.9% in May. The number of basic necessities for which prices were controlled fell at the time from 14 to 8, while the government substantially raised the prices of electricity, coal, and gas (from 25% to 60%, see BNB, 1993, pp. 37 and 39).

While the variation in the foreign exchange rate was above inflation in 1991, it fell below inflation from 1992 to 1995 inclusive. That caused a fall in the competitiveness of Bulgarian prices or a real appreciation of the domestic currency. The wages referred to in Table 2 are public-sector wages, which are the only data available. The changes in them reveal a decline in real wages except for the year 1997. Even so, they rose considerably in nominal terms, which was most certainly favoured by mechanisms for index-linking wages to inflation, which mechanisms were put in place in 1990 (BNB, 1990, p. 27 or for more detailed explanations, OECD, 1997, p. 49).

Table 3. Gross savings in millions of (2005) Leva

	1991	1992	1993	1994	1995	1996	1997
Gross savings	65.60	41.58	19.27	23.19	37.44	32.89	39.28

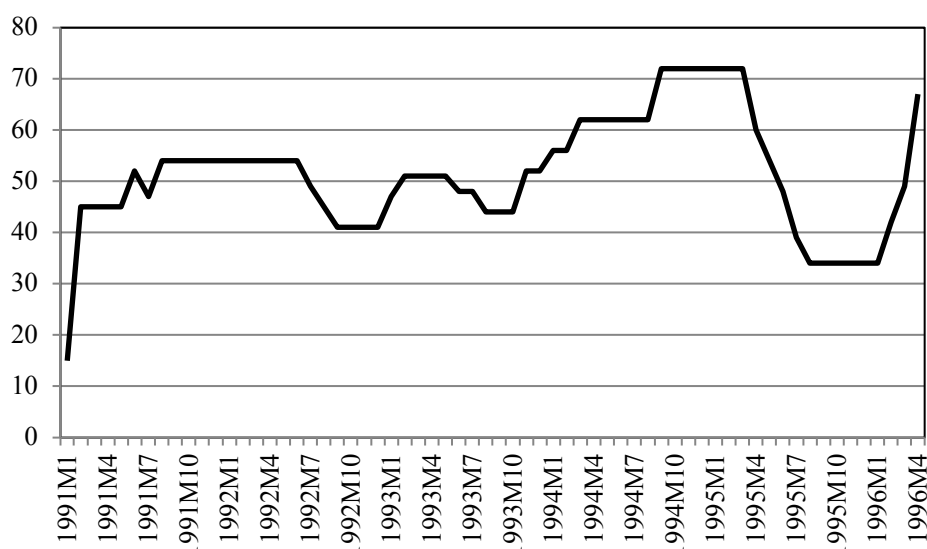
Source: IMF and BNG; authors' calculations, using the GDP deflator (2005 = 100).

Another surprising feature is evident from Table 2. What could explain the upturn in inflation in 1994 compared with 1993 (the rates of growth of the consumer price index were 83.5% in 1994 and 42% in 1993)? The rise in economic activity (GDP growth rate of 1.82%) certainly favoured this phenomenon. It should also be pointed out that there was a surge in inflation in February 1994 (inflation for that month was 21.9% whereas on average it was slightly under 7% for the year). This surge was caused by the announcement of the introduction of VAT and the increase of energy prices (see BNB, 1994, pp. 30-31). But these explanations may seem inadequate: the rate of GDP growth was 2.73% in 1995 whereas inflation was curbed. It seems that the changing pattern of inflation cannot be understood without taking into account the changes in monetary policy, or more specifically, changes in the rates policy by the National Bank of Bulgaria (the central bank) over the period. Sgard (1999) also emphasizes the role played by this rates policy on the instability observed. Figure 1 plots changes in the interest rate consented by the central bank for refinancing operations of commercial banks from January 1991 until April 1996. The rates shown were below the rates of inflation (this was also the case for average debt interest rates, that is, for interest rates applied to borrowers by banks): over the entire period, real interest rates were generally negative (except for much of the year 1995 and the first half of 1996 for the main refinancing rate and the debtor rate; see Poirot, 2003, p. 47 for details).

Several periods can be identified. From the second half of 1991 to the beginning of the second half of 1992 was a period of stable interest rates. Then a period of unstable rates began: a fall in the third quarter 1992 (from 54% in June reaching 41% in September), a slight recovery in the first quarter of 1993, then a new fall from May to August 1993. This movement triggered a decline in the quantity of assets held in Lev for the profit of assets in dollars (theory of interest rate parity): foreign exchange reserves fell (the central bank was committed *de facto* to defending the exchange rate). The first substantial depreciations were observed as from the final quarter 1993: 3.26% in October and then 8.67% in November (see BNB, 1993, p. 65). Foreign exchange was truly unleashed in March (27% depreciation) and April 1994 (17%

depreciation).⁵ It is obvious, from this point on, that foreign exchange fluctuations fuelled inflationary dynamics.

Figure 1. Principal refinancing rate (bank rate), end of period, January 1991–April 1996



Source: IMF

As a result of these devaluations, the IMF intervened in April 1994 to put an end to the foreign exchange crisis, allowing the stock of reserves to rise from about US\$1.5 billion in April 1994 to nearly \$3 billion the following months (Dobrinsky, 2000)⁶. That marked the beginning of the period during which a more restrictive monetary policy appeared:

“In contrast to the previous year, BNB interest rate policy in 1994 was consistently restrictive, which reflected a general upward trend in nominal lending and deposit rates. The basic interest rate was raised three times (20 percentage points) over 1994, reaching the highest-ever level of 72% simple annual rate. Consequently, deposit and lending interest rates reached record nominal highs as well, but the high inflation rate changed them significantly in real terms” (BNB, 1994, p. 66).

⁵ “As monthly inflation slowed in the first half of 1993 under an average effective basic annual interest rate of 60 per cent, the relative return on lev denominated assets began to grow. Authorities responded to lower inflation by decreasing the basic rate on two occasions between August and October, bringing it down to 52 per cent. At the same time, monthly inflation steadily picked up from 1% in July to 4.2% in October, due in part to seasonal factors. The implied reduction in the expected return to lev-denominated assets appears to have triggered a portfolio shift of the population and investors. This is illustrated [...] by the decline in foreign exchange reserves, which were used by monetary authorities to support the value of the lev. As this process continued, authorities eventually became alarmed and raised the basic rate, first to 63% in November and then to 69% in January 1994. They also allowed some limited depreciation of the currency. But, given the magnitude of the depletion of reserves and the knowledge that authorities could not prop up the value of the lev much longer, expectations had apparently already become too destabilised for the decline in money demand to be reversed. The BNB finally gave up defending the lev in March, leading to an immediate devaluation of the currency by almost 30% in that month, and another devaluation of 17% in April. This was followed by rapid inflation and continual instability until the latter months of the year” (OECD, 1997, pp.29-31).

⁶ “the pressure on the exchange rate resulted in a run on the currency which lasted until March 1994. The end of the crisis came in April with the signing of a standby agreement with the IMF providing financial assistance to Bulgaria, in view of the London Club deal. It was complemented by further assistance from the World Bank and the EU” (Dobrinsky, 2000, p. 594)

The higher interest rates and the IMF intervention even attracted foreign capital that underpinned increased investment (Table 1). The pace of privatization accelerated, as did that of inward FDI (Poirot, 2003, p. 41). In 1995 and the beginning of 1996, Bulgaria resumed servicing its foreign debt:

“In 1995, BNB interest rate policy played a key role in reviving the confidence in the national currency and suppressing inflationary expectations. In 1994, the BNB in its attempts to tighten monetary constraints raised the basic interest rate on several occasions to counterbalance the dramatic lev devaluation. In 1995 however, the basic interest rate was gradually decreased from 72% to 34%. The basic interest rate was gradually reduced on seven occasions between April and July. The BNB actions proved to be conservative, given the slower decrease in the basic interest rate relative to the inflation rate decline” (BNB, 1995, p. 62).

This improvement, which ultimately proved to be deceptive, was thwarted by the fragility of the banking and financial system, which became apparent from the end of 1995. For Sgard (1999, pp. 219-220), people were confronted with a continuum of “signs of financial weakening [which] multiplied over the years: expensive and ill-managed bank recapitalization at the end of 1993, a first foreign exchange crisis in 1994, a series of interventions by the central bank in small institutions in 1994 and 1995, and finally the takeover of a first-rank private bank in December 1995”.

This financial fragility is also at the core of Poirot’s (2003) analysis: he claims the fragility was the consequence of the continuation of a generalized mechanism of soft budget constraints and particularly persistent within state-controlled firms, compounded by a culture of “non-payment” to the banking sector facilitated by inadequate observance of contracts and rare and inefficient supervisory measures (Poirot, 2004, pp. 41-47). The concept of “loose budgetary constraint” (Kornai, 1979; 1986) stands against the principle of “hard budgetary constraint” that prevails in capitalist economies. In a socialist or even post-socialist environment, the survival of state enterprises does not depend on their economic performance but on relations with the bureaucracy that maintain financing. So, in the event of poor results, firms do not go bankrupt but continue to receive credit from the banking system, which is itself refinanced by the central bank.

Vahabi (2005, p. 150) shows that relations between the state and firms change radically in the course of post-socialist transformation, banks replace the state in financing firms but loose budgetary constraint remains a major problem in various post-socialist economies. In this way, recourse to the concept of loose budgetary constraint provides insight into the refinancing of insolvent banks by the central bank, as do loans granted by banks to insolvent firms.⁷ In addition, Berlemann and Nenovsky (2004) claim that the appearance of Ponzi type financial pyramids was facilitated by the liberal policy of the BNB with respect to granting banking licences: a large number and a wide variety of financial actors appeared. The same authors (p. 256) state that 35 out of 44 Bulgarian banks “were losing money” in June 1994. By way of illustration, Dilova (1999) shows that banks, knowing that they would be refinanced by the central bank whatever happened, felt no need to comply with prudential ratios and to check that their borrowers were solvent.

In agreement with contemporary analyses by the IMF, Poirot (2003) emphasizes that this financial fragility was a fundamental factor in understanding Bulgaria’s economic trajectory. But he refrains from seeing in this the consequence of too slow a mechanism of privatization, preferring to resort to the concept of “chaotic hysteresis” to understand the way in which a

⁷ Claessens *et al.* (1997) show that this phenomenon was particularly widespread in state enterprises in Bulgaria.

transition economy found itself overly influenced by uncertainty and asymmetric information. These factors have made it possible for a dangerous mechanism to be put in place: collapse of the banking system was averted or delayed by refinancing conditions facilitated by the BNB, a behaviour that resulted in diminished confidence in the domestic currency with respect to foreign currencies at the very time when the central bank was seeking to maintain stable exchange rates.

The breach was opened in late 1995. The obvious overvaluing of foreign exchange went hand-in-hand with the current account deficit; a new valuation was expected. The share of deposits in foreign currency increased and substantial pressure grew on foreign exchange (see OECD, 1997 p. 32), which did not make the BNB change its strategy though:

“From December 1995 to June 1996, total refinancing of commercial banks with the central bank increased by 145% while 90% of these flows carried no collateral. In the face of growing pressure on the foreign exchange market, it committed itself to a pointless and costly defence of its par value; refusing in particular to raise its interest rates for long weeks” (Sgard, 1999, p. 220, see also Graph 3).

This mechanism increased doubts on international financial markets about the government's capacity to procure the necessary foreign exchange to pay the interest due on its foreign debt: the financial and banking crisis was liable to degenerate into a public debt crisis. While the monthly rates of depreciation of the Lev had been less than 2% since November 1994 (except for August 1995, during which month the currency fell against the dollar by 2.44%), the Lev depreciated by 3.23% in January 1996, 2.84% in February, 4.49% in March, and 4.61% in April. These movements fed inflation.

3.3 Towards hyperinflation

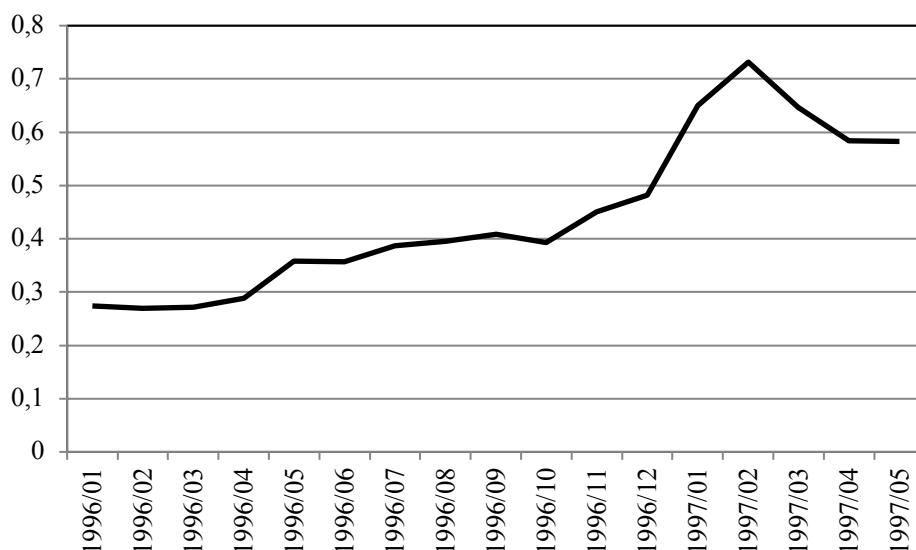
The inflationary dynamic finally degenerated into hyperinflation early in 1996. This was underpinned by the macroeconomic instability described earlier. It will be remembered that it was characterized by high inflation, which became sensitive to variations in the foreign exchange rate. The true loss of confidence in Bulgarian currency became apparent in spring 1996, caused by Bulgarians' loss of confidence in the banking system. For Dobrinsky (2000), expectations about inflation changed in connection with the banking crisis and the drying up of the central bank's foreign exchange reserves:

“Up to a point, the central bank defended the domestic currency by interventions in the forex market, but the main outcome was the depletion of reserves. [...] the 1996 crisis was amplified substantially by the almost complete loss of public confidence in Bulgarian commercial banks. In the event, the run on the currency in 1996 was coupled with a simultaneous run on the banking system, resulting in massive capital flight and the failure of 15 commercial banks” (Dobrinsky, 2000, p. 585).

Sgard (1999) notes the crystallization of three factors during the first half of 1996: withdrawals by depositors, the fall in foreign exchange reserves, and agents' expectations about the government's difficulties in meeting its foreign financial obligations laid down by the 1994 Brady plan. This dynamic can be seen in Figure 2 which reflects the fact that Bulgarians converted a growing share of their means of payment from the Lev into foreign currencies. In this way, Sgard (1999, p. 221) specifies that “for 1996 as a whole, 21% of deposits in Lev and

42% of deposits in foreign currencies were withdrawn from banks, the latter figure representing 70% of foreign exchange reserves at the start of the year”.

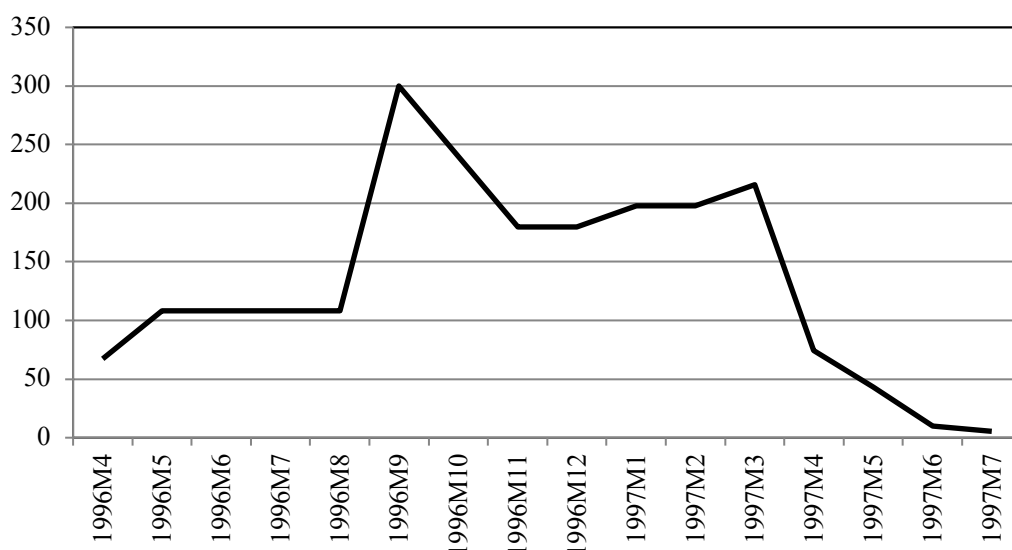
Figure 2. Proportion of foreign currencies in M2, January 1996–June 1997



Source: IMF; authors' calculations

Hyperinflation, defined as the flight from domestic currency into foreign currencies, was nonetheless warded off until 1997. In May 1996, a standby agreement was signed with the IMF: it enabled the Bulgarian government to meet its commitments towards its international creditors for 1996 deadlines. At the same time, the central bank raised its interest rates (see Figure 3), opening a period during which monetary policy was actively mobilized.

Figure 3. Principal refinancing rate (bank rate), end of period, April 1996–July 1997



Source: IMF

However, fears about the state's solvency and the capacity of the Bulgarian economy to obtain the foreign currency required for foreign payments were not lastingly attenuated. As the data presented by Sgard (1999, p. 223) show, whereas the primary budgetary balance moved

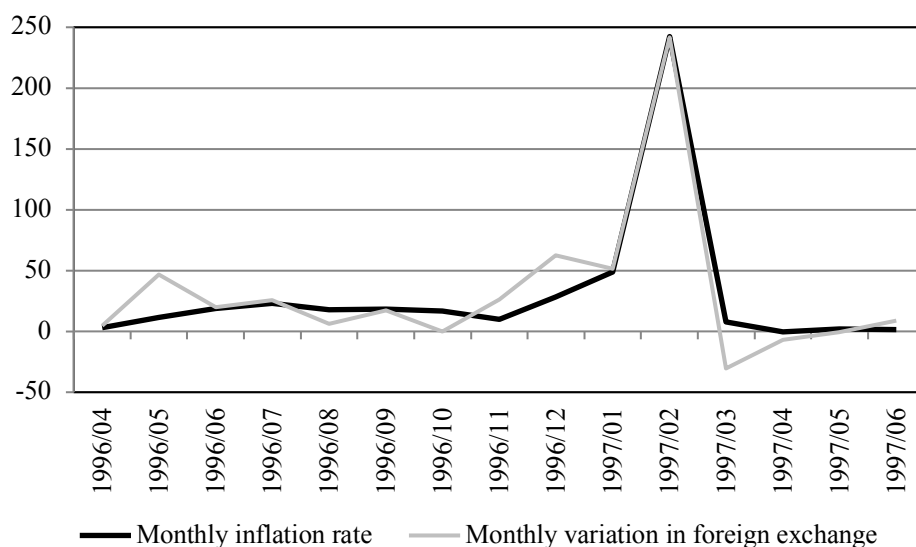
from a surplus of 2.1% of GDP in the first quarter 1996 to a surplus of 11.7% in the final quarter, the budgetary deficit was still put at 11% of GDP at the end of 1996 because of an explosion in the burden of interest (estimated at 22.7% of GDP in the final quarter of 1996 compared with 15.2% in the first quarter of the same year). In the space of one year, foreign public debt had risen from 73% of GDP to 243% by the end of 1996. This increase was caused by the marked appreciation of the Lev. But it was also caused mechanically by the change in monetary policy strategy identified in Figure 3 as new securities were issued at a far higher rate of interest than matured securities.

The change in monetary policy meant debtors were more exposed and entailed new bank failures although the conditions for refinancing commercial banks were still just as “unacademic”. Berlemann and Nenovsky (2004, p. 254) estimate that non-collateralized refinancing granted in June 1996 reached 80% of the refinancing granted to commercial banks, whether in domestic or foreign currencies. The growing tendency of Bulgarians to seek out foreign currency (US dollars and German marks) as an instrument of reserve value was not reversed. Accordingly, the flight of capital recorded in balance of payments statistics was substantial. In 1996, the balance of payments was largely negative (-\$738 million) whereas the current balance was slightly positive (\$15.7 million; IMF data). This phenomenon was caused by Bulgarians because the Lev was only convertible internally at the time (Poirot, 2003, p. 48). External speculation was therefore impossible.

Being trapped in this vicious circle, a conjunction of events that would have been harmless in other circumstances, was to prove decisive in the occurrence of hyperinflation in January–February 1997. In November 1996, acknowledging that the economic situation was explosive, and rather than addressing the balance of payments problem to avoid it flaring up, the IMF suspended payments of an instalment of standby credit and proposed the country adopt a currency board. The IMF claimed this measure could be expected to have two advantages: stopping inflation because of the rule on monetary issuing (each unit of domestic currency issued had to be covered by an equivalent value in foreign currency) and the guaranteeing of the value of monetary assets held in foreign currencies. This proposal caused “considerable debate” in Bulgaria as acknowledged by Gould (1999), who was the IMF’s senior economist at the time. Furthermore it came at a time of social and political upheaval: the electoral campaign for a new head of state was ending against this background of financial crisis.⁸ The high point of this crisis was certainly the attack on parliament on 10 January 1997 when rumours spread of a possible freezing of deposits and of default on domestic public debt. Hyperinflation then began, following the explosion in foreign exchange (see Figure 4); early legislative elections were called for April. In that month of April, the presidential majority managed to ratify the new agreements with the IMF and set up a currency board; this monetary regime was effective as of July 1997 and was still in force in 2016.

⁸ The November 1996 presidential elections were won by the conservative movement candidate, causing a change of president, against the centre-left movement that maintained its parliamentary majority at the time.

Figure 4: Monthly inflation rate and foreign exchange variation rate, April 1996–July 1997



Source: IMF

The hyperinflation of January 1997 was the expression of rejection of the domestic currency. It was the consequence of the crisis of confidence in the domestic currency expressed by its users which can be explained by the totality of the sequence we have set out. In accordance with the proposal by Orléan (2007, p. 195), we take it that the change in the M/P ratio (means of payment available to non-financial agents/price) is an indicator that can be used to understand the monetary crisis of confidence. Figure 5 confirms that Bulgarians' confidence in their currency declined over the whole of the period examined here, but that this decline occurred at different paces. The fall that first set in seemed to have been stemmed from summer 1994 to spring 1996. Then, mistrust surged, which was logically marked by hyperinflation itself. As of spring 1997 the ratio was able to rise thanks to the adoption of the currency board.

Figure 5. Real value of the monetary mass (M2) in millions of Leva, 1991-1997



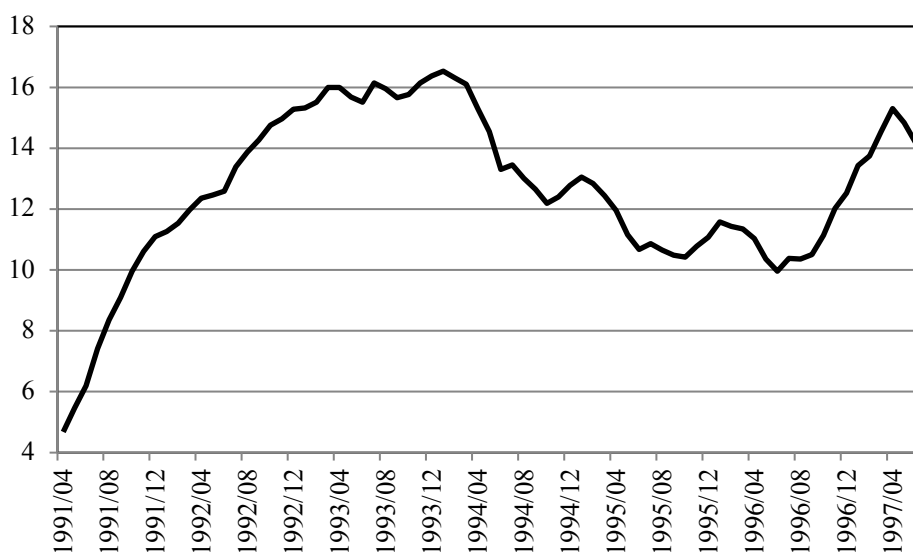
Source: authors' calculations based on nominal M2 data in millions of Leva, deflated by CPI (base 1 in March 1994). Data from BNB.

4. Proposition: an amended post-Keynesian sequence

The foregoing analysis fits in perfectly with the dynamic generating hyperinflation presented in Section 2. Remember that Section 2 showed that hyperinflation is generated by the conjunction of three factors. First the presence of a substantial distributive conflict that causes high inflation. Then, this high inflation triggers the development of price and wage indexing mechanisms, which in turn fuel the inflationary dynamic. Expectations of inflation change. Lastly, the dynamic of foreign exchange increasingly influences prices: hyperinflation arises when a run on foreign exchange occurs, the three cardinal factors of money having been annihilated.

For the Bulgaria of the 1990s it is difficult to find factors attesting to any particularly virulent distributive conflict. For one thing, unemployment was high over the whole of the period and rose clearly in 1992 and 1993 before falling in the following years (Figure 6). Accordingly workers' bargaining power cannot, it seems, have been a driving force behind the high inflation observed from the early 1990s onward. Similarly, while the fall in unemployment from 1994 to 1996 may attest to a certain reinforcement of workers' bargaining power, it is difficult to conclude that this was the cause of higher inflation. Besides, the proportion of wages in GDP declined from 50.7% of GDP in 1995 to 48.3% in 1996 and 42.8%⁹ in 1997, which seems to be incompatible with any strengthening of workers' bargaining power.

Figure 6. Unemployment rate in Bulgaria, 1991-1997

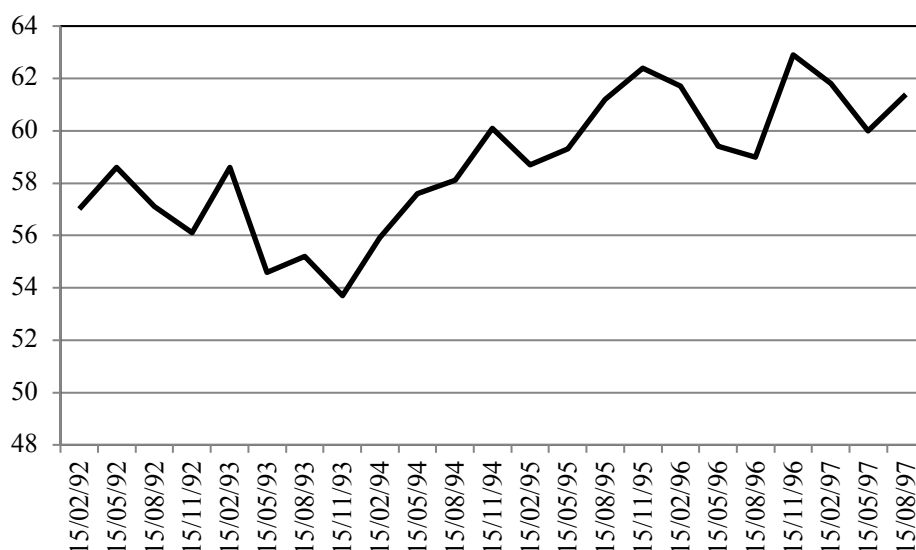


Source: Ministry of Labour and Social Policy of the Republic of Bulgaria. Datastream: data extracted 9 June 2016.

It is also difficult to view that firms' market power could be particularly high. The Bulgarian economy underwent a process of opening up to international trade and so local producers had to face new competition, which adversely affected their market power. Another factor that might be evidence of limited market power was that there remained unused productive capacity (the rate of use of productive capacity was very low, between 54-63%, although it strengthened over the same years in which unemployment fell, as Figure 7 shows). It is generally accepted that firms in such a situation of underused capacity seek to win market share rather than raise prices.

⁹ *Adjusted Wage Share ALCD0* series, AMECO, consulted on line on 16 September 2016. There is no estimation for the part of wages in GDP in Bulgaria before 1995.

Figure 7. Rate of use of productive capacity, 1992-1997



Source: DG ECFIN: Directorate General for Economic and Financial Affairs: Datastream: data extracted 9 June 2016.

These factors invite us to consider other causes than distributive conflict to understand the high levels of inflation in 1991 (see Table 2). The specialized literature on transitional economies provides convincing evidence for explaining why transition processes are generally accompanied by episodes of strong inflation.

First, it takes time for agents to adapt to an environment that has suddenly changed. Sapir (1995, p. 145) explains that “liberalization of the economy triggers a gigantic process of learning in which agents, through their personal experience, simultaneously shift the price structure”. He goes on to claim (p. 126) that “the combination of almost total liberalization of prices with the transition to convertibility, in a situation where markets are little developed, leads to the emergence of ‘noise’ in the information system. Relative prices become unstable”. These particular phenomena observed in the transition in progress go some way to explaining the raging inflation seen in Bulgaria in 1992.

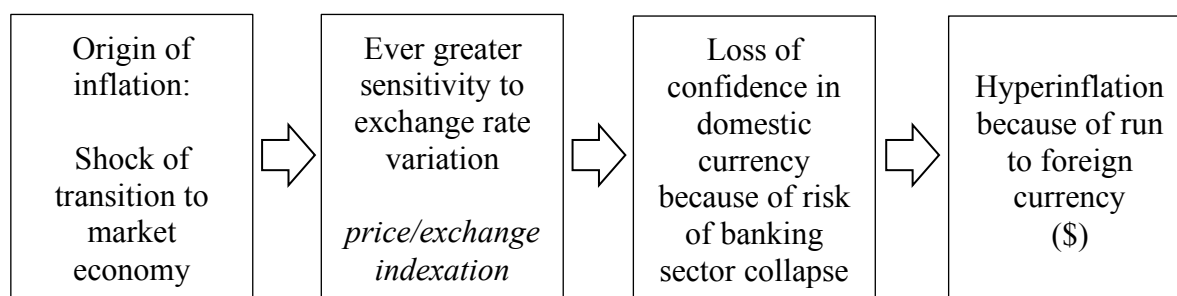
Secondly, a theoretical concept may be suggested: this is the phenomenon of shortage inflation or ‘*shortage-flation*’. This mechanism, studied by, among others, Kolodko and McMahon (1987), refers to the underlying inflation in an administered economy. As prices are controlled and rigid, inflation cannot occur; adjustments are made by repressing demand and not all the quantities demanded can be obtained at the advertised price. There is then a supply shortage. The conditions for matching supply and demand on markets for goods change whenever prices are liberalized, as soon as the transition is initiated; inflation occurs, reducing shortages, causing a fall in demand, and possibly a rise in the incentive to invest which supposedly increases supply. These factors are consistent with macroeconomic dynamics described in the previous section with the analysis proposed by Taylor (1994, p. 69): “When constraints in all markets were suddenly lifted in a global shock incorporating near-total price liberalization, demand surged [...] (exceeding) potential supply, some new limiting mechanisms had to appear. Prices jumps were the only possible outcome”.

Other factors affecting production supply were observed causing inflation in Bulgaria during the transition. Transitional economies usually have specific characteristics concerning inter-industry trade: low divisibility and low substitutability of products (Sapir, 1993). When commercial relations are altered by transition, shortages in supply may paralyse activity and fuel price rises. Generally, transaction costs are clearly higher during the transition, a

phenomenon that is caused by uncertainty about suppliers and outlets, by the necessity to modify the production process, or by the break off in pre-existing commercial relations. Specifically, in the Bulgarian case, and in addition to the obsolescence of the productive apparatus mentioned in the previous section, Borenzstein *et al.* (1993, pp. 6-8) indicate that the productive supply must cope with various types of shock experienced in the early stages of transition. Such shocks generate shortages. Bulgarian producers had to face interruptions in the supply of imported raw materials (caused by the break-up of the USSR, formerly the principal supplier) and in semi-finished products. Repeated interruptions were also observed in nuclear electricity production. All of these factors increased productive difficulties and were liable to reinforce the inflationary dynamic. We now understand the appearance of substantial inflation in the absence of any virulent distributive conflict in Bulgaria. Distributive conflict was replaced by transition shock as the initial and main cause of inflation.

On this basis, there then developed mechanisms for index-linking wages to prices¹⁰ as seen in subsection 3.2 while the foreign exchange dynamic was to become progressively more important in the price dynamic, this foreign exchange dynamic itself being affected by the monetary policy conducted. We now find the factors present in the generic post-Keynesian sequence. However, the looping of the sequence observed in Bulgaria also differs from this generic sequence. It was not so much the fear of a balance of payments crisis that triggered the self-fulfilling expectation of a break in foreign exchange as mistrust of the corrupt domestic banking sector that annihilated confidence in the domestic currency and made people look for foreign currencies, thereby causing the foreign exchange rate to explode.

This analysis leads us to propose the amended causal sequence below:



Here it is the bank panic that is decisive. The realization that the entire banking system might collapse causes mistrust of the national currency, which is the origin of the run to foreign currencies and the appearance of hyperinflation.

¹⁰ Andreff (1994) shows that in centralized planned economies (such as Bulgaria before transition), there was a particular distribution conflict opposing households (receiving wages and consuming) and central planners (receiving investment funds and accumulating capital). Andreff (1994, p. 827) reveals that investment and real wages were closely correlated before the onset of transition in Bulgaria. He identifies evidence that indexation mechanisms were in place in the Bulgarian economy before transition. He explains that when the transition kicked in, an inflationary surge was mechanically followed by a rise in wages that fuelled inflation again: it was an inertial inflation mechanism that was particularly intense in Bulgaria compared with other transitional economies. This 'inertial' component that was indexed on inflation highlighted by Andreff for the Bulgarian case is described by Taylor (1994, p. 67): "The post-socialist experience is depressingly similar, even to the extent to which inflationary processes are becoming institutionalized or inertial as economic actors learn to use whatever market power they possess to raise their prices in self-protection against generalized price increases. As argued below, an enhanced inertial component in the price spiral is one fundamental reason why it will be very difficult to reduce post-socialist inflations".

5. An attempt at econometric confirmation

In this section, we perform a few simple econometric tests to investigate the key role played by the factors discussed above (primarily the foreign exchange rate and the index-linking phenomenon) in explaining first high inflation and then hyperinflation in Bulgaria. Nevertheless, so as not to exclude *a priori* more traditional explanations of inflation, we voluntarily remain within a general framework of study. Accordingly, we compare our findings with results from a monetarist perspective, emphasizing the role of the quantity of money as the explanation of the price explosion.

The analysis in the previous section and the Bulgarian data on prices show without a doubt the occurrence of two sub periods.¹¹ The first ran from April 1991 to late March 1996. We ignore the early months of 1991 that correspond *strictu sensu* to the transition shock with the deregulation of many prices and the opening up of the economy. The second period, beginning in April 1996, covered the hyperinflationary phenomenon proper. The increase in monthly prices went into overdrive up until the hyperinflationary peak of February 1997 with monthly inflation at 242%. It ended in late June 1997 with the adoption of the currency board, which represented a radical change of monetary regime justifying the discontinuation of our analysis.

Initially, we conduct standard unit root tests to determine the order of integration of time-series. For the first period, these are performed with a constant (cf. Table 4), the presence of a trend being systematically rejected. In the augmented Dickey-Fuller (ADF) tests, the number of optimal lags is determined according to the Akaike information criterion. For the Phillips-Peron (PP) tests and Kwiatkowski-Phillips-Schmidt-Shinn (KPSS) tests, the number of lags is defined using the Newey-West procedure, the different results are shown in square brackets. Ultimately, the unit root hypothesis is systematically rejected at the critical 1% level for all the variables considered.¹²

Table 4. Unit root tests for the first period, April 1991–March 1996

Variables	ADF Test		PP Test		KPSS Test	
$\Delta Lgpci$	-13.03***	[0]	-11.85***	[1]	0.38***	[0]
$\Delta Lgexch$	-9.25***	[0]	-8.92***	[2]	0.09***	[3]
ΔLgm_1	-5.51***	[6]	-9.43***	[4]	0.08***	[5]

*** significant at critical 1% level.

For the second period from April 1996 to June 1997, the power of the unit root tests poses a real problem because of the very insufficient number of observations available ($n = 15$). It is therefore preferable not to use the ADF and PP tests. Consequently, as an alternative, we use the KPSS test with a constant, even if it has also very moderate power for a small sample. Bearing in mind the limits stated above, Table 5 seems to show that the series considered are stationary at the 5% level for the hyper inflationary period in Bulgaria.

¹¹ The consumer price index is from the IMF's IFS (International Financial Statistics) data base, the foreign exchange rate and monetary mass are from Bulgarian National Bank reports from 1991 to 1997. These data are those used previously in the article.

¹² $\Delta Lgpci$ is the first difference of the consumer price index logarithm; $\Delta Lgexch$ is the first difference of the indirect foreign exchange rate logarithm (\$1 for 'x' Lev); ΔLgm_1 is the first difference of the logarithm of the monetary mass (M1). Here, therefore, we work directly in growth rates.

Table 5. Stationarity tests over the second period, April 1996–June 1997

Variables	KPSS Test
$\Delta Lgpci$	0.12**
$\Delta Lgexch$	0.08**
ΔLgm_1	0.45**

** significant at critical 5% level.

In fact, this problem occurs systematically in studying hyperinflation and is widely recognized in the econometric literature (cf., among others, Slavova, 2003 and Petrovitc *et al.*, 1999). Indeed, periods of hyperinflation or near-hyperinflation are often narrowly circumscribed in time. Moreover, we feel it is risky to use co-integration techniques to determine the existence of any long-term relationship between two or more variables over so short a period of time. It can be noted that this difficulty is not recent as it was pointed out quite rightly by Burdekin and Burkett (1998) on the subject of work by Michael *et al.* (1994) on German hyperinflation. Those investigators used, among other things, co-integration tests *à la* Engle and Granger (1987) for a period of less than 18 months, which is clearly in contradiction with the idea of a long-term relationship.

The use of co-integration techniques may call for circumspection even in the case of the first period of high inflation in Bulgaria (April 1991 to March 1996). While there is no room for doubt when these techniques are used in studies covering one or more decades, the question may legitimately arise from the point of view of the econometrics applied about a five-year period. In this article, it is the first reason that leads us to use growth rate data (inflation rate) rather than level data (consumer price index), which increases the probability of obtaining stationary data. This stationarity of time-series makes it possible to perform econometric regressions based on standard methods of the ordinary least squares (OLS) type. The second reason is the possibility of directly testing the quantity theory of money dynamically, with the rate of growth of the monetary mass explaining the rate of growth of prices.

In Table 6 we test the significance of several variables in determining high inflation in Bulgaria by the following regression:

$$\begin{aligned} \Delta Lgpci = & a_0 + a_1 \Delta Lgexch + a_2 \Delta Lgexch(-1) + a_3 \Delta Lgpci(-1) \\ & + a_4 \Delta Lgm_1 + a_5 \Delta Lgm_1(-1) + a_6 Dum_{05:1992} + \varepsilon \end{aligned}$$

where $\Delta Lgpci$, is the rate of growth of the consumer price index; $\Delta Lgpci(-1)$ the rate of growth of the consumer price index lagged by one period; $\Delta Lgexch$ the rate of growth of the foreign exchange rate; $\Delta Lgexch(-1)$ the rate of growth of the foreign exchange rate lagged by one period; ΔLgm_1 the rate of growth of the monetary mass; $\Delta Lgm_1(-1)$ the rate of growth of the monetary mass lagged by one period; $Dum_{05:1992}$ the qualitative variable for May 1992, and ε the error term.

Thus, we evaluate six econometric representations. Model (I) corresponds to the initial starting model that also includes a quantitative variable designed to account for a new wave of energy price deregulation (coal, gas, and oil), in May 1992 and forcing up inflation. It should be noted that in April 1994, Bulgaria introduced a new uniform rate VAT, which brought about a positive shock on prices. Here we could have introduced another quantitative variable to account for this event. However, we prefer to dismiss this possibility because another factor is superimposed during that same month of April: the sharp rise in regulated prices notably for electricity, fuels such as coal and petrol, and in transport and postal services (see BNB, 1994,

pp. 28 and 30-31). This superimposition of events would therefore overestimate the part played by a binary quantitative variable for April 1994, all the more so because it is impossible in the context of this article to determine how much of the effect is attributable to VAT and how much to price rises.

Models (II) and (III) are two fundamentally opposing representations. Model (II) is equivalent to the post-Keynesian view as amended and developed in the previous section. It reveals the importance and significance of the foreign exchange rate and indexation phenomena. Model (III) corresponds to the extended view of the quantity theory of money, explaining inflation by the rate of variation of the monetary mass and the rate of variation of the monetary mass lagged by one period. Where Bulgaria is concerned, explaining the rise in prices by the quantity of money produces inconclusive results judging by the non-significant values of the explanatory variables, the near zero determination coefficient, and the close autocorrelation of residuals. Model (IV) compared with (II) indicates the scale of price deregulation in late spring 1992. Lastly, models (V) and (VI) pertain to an explanation of inflation that is strictly based on foreign exchange rate movements. Ultimately, paradigm (II), without the quantity of money, explains inflation significantly with an R^2 of the order of 54%. We believe that this first period at least partly validates the amended post-Keynesian model based on the role of foreign exchange and index-linking phenomena, revealing the capacity of firms to pass on price rises (the pass-through principle).

Another point in connection with the initial shock of transition ought to be emphasized. By progressively reducing the first period of analysis of model (V), the unexplained character of inflation by the foreign exchange rate is limited. We attribute this to *shortageflation*, the effects of which diminish as time goes by and as the 1991 shock, with the first deregulation of prices and the opening up of the economy, recedes into the distance. By way of illustration, in model (Vb), for which the data begin later, in June 1992, inflation is explained to a greater extent by variations in the foreign exchange rate. The results are collected in Table 7 below.

Table 6. Determinants of inflation in Bulgaria over the first period, April 1991 - March 1996

Explanatory variables	(I)	(II)	(III)	(IV)	(V)	(VI)
Constant	0.020*** (3.646)	0.021*** (4.727)	0.043*** (9.012)	0.024*** (4.847)	0.035*** (9.272)	0.037*** (9.140)
Exchange rate variation	0.223*** (3.531)	0.191*** (3.219)	—	0.184*** (2.727)	0.202*** (2.758)	0.256*** (3.404)
Exchange rate variation lagged by one period	0.214*** (4.456)	0.249*** (5.332)	—	0.228*** (4.335)	0.149*** (2.912)	—
Inflation lagged by one period	0.217*** (3.911)	0.233*** (4.171)	—	0.212*** (3.361)	—	—
Monetary mass variation rate	−0.089 (−1.047)	—	0.000 (−0.003)	—	—	—
Monetary mass variation rate lagged by one period	0.142 (1.718)	—	0.237** (2.172)	—	—	—
Variable <i>Dummy</i> _{05:1992}	0.092*** (4.321)	0.090*** (4.145)	—	—	—	—
<i>R</i> ²	0.579	0.540	0.078	0.396	0.274	0.166
Breusch-Godfrey test (stat. <i>LM</i>)	4.111	2.791	15.773#	2.881	4.139	5.734#

*** and ** significant at critical 1% and 5% levels. Student's statistics are in brackets. # indicates autocorrelation at 5% level, the test is conducted for a maximum lag of order 4.

Table 7. Results on shortened samples of the first period¹³

	(V) 04:1991–03:1996	(Va) 01:1992–03:1996	(Vb) 06:1992–03:1996
Explanatory variables			
Constant	0.035***	0.030***	0.026***
Exchange rate variation	0.202***	0.203**	0.215***
Exchange rate variation lagged by one period	0.149***	0.334***	0.382***
R^2	0.274	0.470	0.608
Observations	60	51	46

*** and ** significant at critical 1% and 5% levels.

The econometric results for the hyperinflationary period are collated in Table 8. Here we use the same order and the same explanatory variables as for the first period – with the obvious exception of the exclusion of the qualitative variable – so as to maintain a degree of homogeneity in the analysis. It should be noted immediately that, in the context of the general model (I), the monetary variables still display no significance. By subtracting these, it is interesting to observe that the explanatory power of models (II) and (IV) is not significantly weakened since the R^2 values remain very high at 91.2 and 91%, respectively.

Model (III), exclusively based on elements relating to the quantity theory of money, yields inconclusive results for several reasons. First, the determination coefficient, of the order of 60%, remains very largely below that of the alternative models, resting on the importance of the foreign exchange rate and even on pass-through phenomena. Next, the presence of very high autocorrelation of errors (at minimum of order 4) suggests that the specifications that attribute a leading role to the variation in the quantity of money in explaining inflation are fragile in the case of Bulgaria. Finally, other regressions, not displayed in Table 8, show that the presence of the foreign exchange rate as an explanatory variable systematically ousts the significance of the monetary mass in determining inflation.

In contradistinction, models (V) and (VI) take account only of explanations involving variations in the foreign exchange rate. Here again, we observe very high R^2 values in the absence of autocorrelation of errors. Finally, specification (IV) is the one that captures our attention because its explanatory power, in connection with the foregoing sections, remains greater than the other models.

The econometric analyses performed above adduce some evidence in favour of our amended sequence with respect to the periods of high inflation and hyperinflation in Bulgaria. Variations in the foreign exchange rate go a long way towards explaining the flight from domestic currency and the price explosion. Moreover, this explanatory power grows within the first period and between the two periods under consideration. Consequently, the initial effect of the transition on the price dynamic is progressively attenuated, giving way to a determination by the foreign exchange rate.

¹³ Student's statistics are omitted so as not to overburden the table.

Table 8. The determinants of hyperinflation in Bulgaria over the second period, April 1996–June 1997

Explanatory variables	(I)	(II)	(III)	(IV)	(V)	(VI)
Constant	−0.038 (−0.753)	−0.041 (−1.078)	0.003 (0.033)	−0.037 (−1.028)	−0.002 (−0.070)	0.051 (1.160)
Exchange rate variation	0.669*** (3.078)	0.828*** (10.142)	—	0.816*** (10.865)	0.763*** (8.685)	0.754*** (6.788)
Exchange rate variation lagged by one period	0.065 (0.241)	−0.083 (−0.484)	—	—	0.260** (2.970)	—
Inflation lagged by one period	0.318 (0.959)	0.458** (2.226)	—	0.369*** (3.361)	—	—
Monetary mass variation rate	0.604 (0.790)	—	2.490*** (4.325)	—	—	—
Monetary mass variation rate lagged by one period	−0.450 (−0.738)	—	−1.219** (−2.215)	—	—	—
R^2	0.918	0.912	0.609	0.910	0.873	0.779
Breusch-Godfrey test (stat. LM)	4.935	5.381	7.912#	3.159	4.384	5.685

*** and ** significant at critical 1% and 5% levels. Student's statistics are in brackets. # indicates autocorrelation at 5% level, the test is performed for a maximum lag of order 4.

6. Conclusion: an amended sequence...that does not challenge the generic reflection

This article reveals the trajectory leading to the hyperinflation observed in Bulgaria at the beginning of 1997. The inflationary shock of the transition acted as the seed bed on which the dynamic was able to develop, while the fragility of the banking sector and the monetary policy conducted were to nurture and then nourish Bulgarians' loss of confidence in their currency and force them to look for substitutes - in this case, for foreign currencies. When loss of confidence crystallized, hyperinflation occurred.

The results of this study enhance the post-Keynesian theoretical framework explaining hyperinflation: the distributive conflict can be replaced by the transition shock in order to explain the high levels of inflation observed from the beginning of the sequence. This high inflation justifies the introduction of mechanisms for indexing prices and wages and changes in expectations. Econometric verifications prove that the foreign exchange dynamic is decisive in the hyperinflationary process. This confirms that hyperinflation must be understood as the rejection of domestic currency in favour of some foreign currency, justifying, if it is to be intelligible, a historical analysis in terms of political economy. A quantitative criterion would not be sufficient to define or identify hyperinflation.

Bulgarian hyperinflation was triggered when the country was in a situation of manifest uncertainty, immersed in a sizeable economic and political crisis. The monetary crisis was inseparable from the political crisis. The monetary crisis in its inflationary dimension came to an end with the introduction of a currency board. This monetary regime officialized the resort to foreign currencies (in this case the German mark) in order to instil the necessary confidence in the monetary unit.

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