

COLUMBIA UNIVERSITY

SCHOOL OF INTERNATIONAL AND PUBLIC AFFAIRS

INFLATION AND HYPERINFLATION

IN THE 20<sup>TH</sup> CENTURY

~ CAUSES AND PATTERNS ~

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## **INTRODUCTION**

Hyperinflation is considered as one of the most socially destructive economic phenomena. Since Columbia University Professor Phillip Cagan's seminar paper in 1956 on that issue, numerous studies have attempted to provide a better understanding of its origin. There is also a vast literature on the appropriate stabilization policies for stopping hyperinflation.

The purpose of this paper is not to review that literature but to examine the circumstances, which lead to hyperinflation during the 20<sup>th</sup> century in three different contexts: after the two great wars, in the aftermath of the debt crisis and during the transition in Eastern Europe. For this and also to reveal the main patterns in the historical record, we shall first present the economic dynamics of hyperinflation before presenting and analysing the cases of hyperinflation.

## **I – INFLATION AND HYPERINFLATION: A THEORETICAL APPROACH**

Inflation is defined as a continuing and rapid rise in the price level. According to Milton Friedman, it is “always and everywhere a monetary phenomenon”. Most economists, whether monetarists or Keynesians, agree that proposition. In what follows, we will study that proposition before presenting the economic dynamics of hyperinflation using the quasi-fiscal deficit approach.

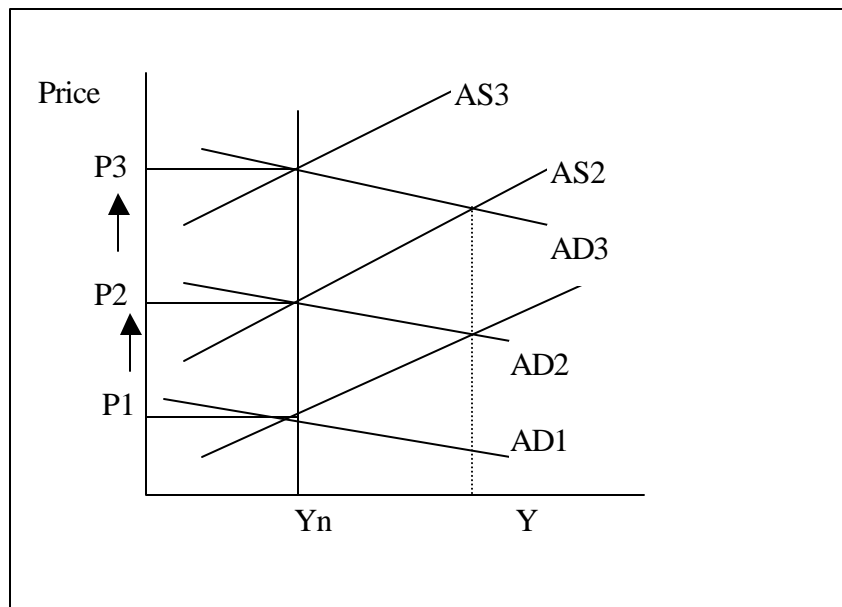
### **I. A] – Inflation as a monetary phenomenon**

#### ***1 - Monetarist view of inflation***

Monetarists use an aggregate supply/aggregate demand framework. Starting from an initial point where output is at the natural rate level, they consider that if the money supply increases, the aggregate demand curve shifts rightward. Output may increase above the natural rate level. The resulting decline in unemployment below the natural rate level will cause wages to rise, and the aggregate supply curve will quickly begin to shift leftward and this, until the economy returns to its natural rate level. At the new equilibrium, the price level has increased. The outcome of a continually increasing money supply is a continually price increase. In monetarist analysis, *the money supply is viewed as the sole source of shifts in the aggregate demand curve*; therefore money growth is the only cause of inflation.

To show that changes in aggregate spending are determined primarily by changes in the money supply, monetarists link the quantity of money  $M$  with total nominal spending ( $P \cdot Y$ ) using the concept of velocity of money defined as the speed of circulation of one unit of money. Velocity is calculated by dividing nominal spending  $P \cdot Y$  by the money supply  $M$ ,  $V = (P \cdot Y) / M$ .

The equation of exchange is obtained by multiplying both sides by  $M$ . If velocity  $V$  is considered to be stable, this equation is transformed into a theory of how aggregate spending is determined and is called the modern quantity theory of money. If money supply increases and the velocity are stable, aggregate spending will increase in the same proportion.



## ***2 - Keynesian view of inflation***

For Keynesians also, a rapidly growing money supply will cause the price level to rise continually at a high rate. There are no other factors that can generate high inflation. Neither fiscal policy alone nor supply-side phenomena can be the source of inflation. Indeed, a negative supply shock shifts the aggregate supply curve backward resulting in output lower than the natural rate level and a higher price. Since unemployment is above the natural rate, the aggregate supply curve will shift back to its initial level. The economy returns to full employment at the initial price level. Concerning fiscal policy, a one-shot increase in

government expenditure leads to only a temporary increase in the inflation rate, when output is above full employment level, not to an inflation in which the price level is continually rising. If government spending increased continually, we could get a continuing rise in the price level, which goes against Friedman's proposition. However, this argument is not solid since, as Keynesians recognize, government expenditure cannot increase continually.

## **I. B] – The quasi-fiscal approach of hyperinflation**

### ***1 - Definitions and concepts***

Hyperinflation definition comes from Cagan (1956) and is "beginning in the month the rise in price exceeds 50 percent and as ending in the month before the monthly rise in prices drops below that amount and stays below for at least a year". This corresponds to 13,000 percent annual.

Before going into the economic dynamics of hyperinflation, it is essential to present three important concepts.

#### *Inflation tax*

Inflation tax is the capital loss to holders of central bank liabilities as a result of inflation:

$$(1) IT = (\Delta P/P) (M/P) \text{ or } IT = \pi(M/P)$$

#### *Seigniorage*

Seigniorage is the revenue the government gets from printing new money:

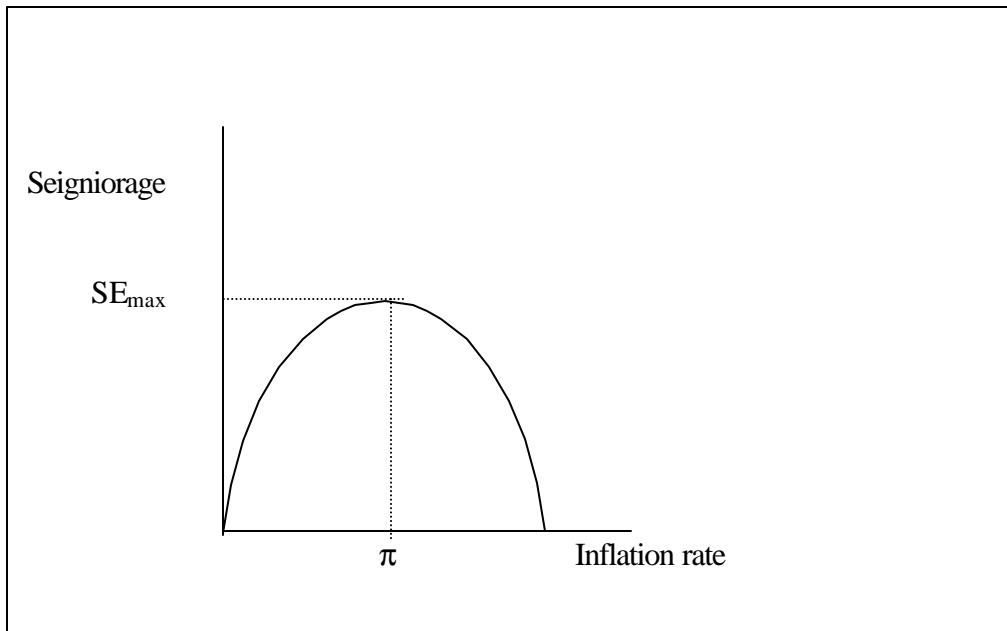
$$(2) SE = \Delta M / P \text{ or } SE = (\Delta M/M)(M/P)$$

In the steady state where  $M/P$  is constant or in other words, when  $\Delta M/M = \Delta P/P$ ,  $IT$  and  $SE$  are equal if  $M/P$  is constant.

#### *Seigniorage Laffer Curve*

Seigniorage Laffer curve shows the relationship between steady state inflation rate and seigniorage revenue. It indicates that seigniorage revenue must rise for while and then fall again as inflation rise. Therefore, there is an inflation rate that produces a maximum amount of seigniorage with a stable rate of inflation. Above that steady state inflation rate, it is possible to

collect more seigniorage than  $SE_{\max}$ , the maximum amount but only if the inflation rate is constantly increasing. We will shortly see that this is the essence of hyperinflation.



## ***2 - The model of hyperinflation with integrated budget constraint***

The integrated budget constraint combines the accounts of the fiscal and monetary authorities that are treated as a single unit.

$$(3) \quad T + \Delta B^g + \Delta M = G + RB^g \text{ (nominal integrated budget constraint)}$$

$$(4) \quad t + \Delta b^g + \Delta M/P = g + rb^g \text{ (real integrated budget constraint)}$$

The usual money demand function is:

(5)  $M/P = L(y, r + \pi^e)$ , which at the steady state long run where real variable  $y$  and  $r$  are constant and the expected inflation is equal to the actual rate, can be rewritten as:

$$(6) \quad M/P = L(\pi).$$

Using (6) and (1), real seigniorage revenue  $SE$  can be rewritten as:

(7)  $SE = \pi L(\pi)$ . This means that in the long run seigniorage depends only on one variable: the rate of inflation. When inflation rises the rate of the inflation tax ( $\pi$ ) increases, but the base ( $L(\pi)$ ) on which the tax is levied decreases since the real monetary base is reduced as individuals reduce their money demand. The bell shape of the steady-state seigniorage Laffer curve is due to the fact that at sufficiently high rates of inflation people simply will not accept more new currency and the real seigniorage revenue will shrink toward zero.

Using (4) and (7) and solving the model in the long run where there is no growth in government debt, we obtain:

$$(8) \quad SE = \pi L(\pi) = g - t + rb^g$$

The right side of this equation is the overall budget deficit; the left side is seigniorage. This equation means that when there is no access to foreign or internal private financing, seigniorage is the only mean to finance the deficit.

Hyperinflation can be experienced when the government faces a greater need of seigniorage to finance its increasing fiscal deficit and after the seigniorage maximizing inflation rate is reached. Above that maximum inflation rate, the Laffer curve indicates that revenue decreases. However, this is true only when we consider the steady state inflation rate (when  $\Delta M/M = \Delta P/P$ ), which is the one used to describe the relationship between seigniorage revenue and inflation. Increasing the inflation rate beyond its steady state level, can allow an increase of seigniorage revenue even when the economy is on the wrong side of the Laffer curve. The reason is that there are lags in the adjustment of prices to new money creation or, in other terms, inflationary expectations tend to lag behind actual price increases. All the dynamics of hyperinflation relies on these lagged inflationary expectations. Indeed, as households realize that the inflation rate is rising, they revise upward their expectations and therefore reduce their real money balances holding, reducing de facto the seigniorage revenue that was collected previously. In order to face the reduction of revenue, the government has to increase the rate of money creation. In other words, once the rate of inflation is beyond the peak of the Laffer curve, the government is forced to continue to increase the rate of monetary growth simply in order to maintain the same level of

seigniorage revenue<sup>1</sup>. The inflation rate rises without bound resulting eventually in hyperinflation.

## **II. A HISTORICAL APPROACH OF HYPERINFLATION. THE DYNAMICS OF HYPERINFLATION**

### **II. A] - A Historical Perspective of Hyperinflation. Early Cases of High Inflation**

The best-known report of high inflation in the ancient world was the case of the Roman Empire in the third century A.D. The Roman emperors became fond of “debasing” the currency, that is, reducing the metallic content of coins that circulated at a given face value. Thus, the silver denarius, which had over a 90% silver content in the first century A.D., was already debased to a 28% silver content under emperor Gordian in 238 A.D. and a content of only 0.02% under Claudius Victorinus in 268 A.D. This led to the first elaborate scheme of price and wage controls known in history. But the inflation during this period averaged only 3 to 4 percent per year. Another famous early inflation is that of Spain in the sixteen century, following the discovery of great deposits of precious metals in America, especially in Mexico and Peru. The Spanish kings encouraged the flow to Spain and tried to block its flow out of the country. The inflow of gold and silver increased the money supply and raised prices significantly, but again the annual rates of inflation were quite low by present standards. (from 1551 – 1600, the average inflation rate was probably less than 2% per year.)

There are only three known truly high inflation before this century, but none reached the hyperinflationary threshold defined by Cagan. The three episodes were related to civil wars and revolutions, which are prone to cause high inflations.

(1). The first case is the U.S. War of Independence (1775-1783). The newly independent American colonies relied little on taxation and foreign borrowing to finance their war effort. Instead, they printed paper money to cover about 80% or so of total expenditures. The inflation rate amounted to a monthly rate of roughly 10%.

(2). The next case came with French Revolution. The post-Revolutionary government established in France in 1789 was immediately strapped for cash, and it resorted to the easiest means of financing available, printing new money. After new printed money went into

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<sup>1</sup> As the Tanzi-Olivera effect describes, higher inflation erodes the real value of tax collected.



circulation, prices naturally started to rise as well. In 1794, inflation reached 100%, the next year, the prices increased by more than 3000%.

(3). The third case happened at the time of the U.S. Civil War (1861-1865). Both the North and the South resorted to money printing, relying less on taxes and sales of public bonds and more on money emission. The high inflation was fueled by the monetization of large government deficits.

## **II. B] - Hyperinflation in early this Century**

### **➤ The Aftermath of WW I : Austria, Germany, Hungary, Poland, Russia**

In the aftermath of World War I, five countries in Central Europe and Asia fell into the grips of hyperinflation, Austria, Germany, Hungary, Poland and the Soviet Union. All these hyperinflations occurred in a relatively short period of time, from 1921 to 1924, and all emerged in the chaotic conditions that followed the end of World War I.

#### ***1. Austria & Hungary***

Austria and Hungary were carved out of the collapsed Hapsburg Empire at the end of World War I. Both countries lost much of their traditional land, while at the same time they were required to absorb the large bureaucracy of the former Empire. As loser of World War I, in the 1920s, these two countries also faced the grim prospects of reparation payments to the victorious allied powers, as set in the treaties of Trianon and Versailles. In Austria and Hungary, the reparation obligations were feared to be large, the mere fact that the Reparation Commission had a major, albeit unknown, claim on the assets of both governments cast a significant shadow over public finances in the two countries. Under a fiat regime, the value of the currency ultimately rests on the ability of the government to keep its budget under control not only in the present but also in the future. Furthermore, as two of the most conspicuously weak governments after World War I, Austria and Hungary were both new states, significant doubts existed inside and outside these countries about their future viability.

In addition, the Austrian government was burdened by the need to make large transfer payments to the unemployed. The Hungarian authorities extended great amounts of highly subsidized credits to the private sector. Thus public budgets were under very heavy strains in both countries. Eventually, these strains erupted as hyperinflations.

### ***3. Germany***

Germany was not a new state, although the prewar regime was crushed. A new and fragile democracy, known as the Weimar Republic, was established, and the new regime was immediately buried under the burdens resulting from the war. With the huge reparations imposed by the Treaty of Versailles, the new state began with a crushing fiscal burden, the staggering value of the reparation payments that the country sent abroad was the central element of public finance from 1919 to 1923, while Germany was ruled by an inexperienced socialist government that could not pass a much needed tax reform. In 1922 and 1923, Germany experienced several armed uprisings and important breakdowns of public order. The situation worsened enormously in 1923 when the French occupied the area of the Ruhr, the industrial heartland of the country. The Germans responded to the occupation with passive resistance and widespread labor strikes. The government paid the strikers by taking loans from the Reichsbank (as the German central bank at that time). Finally, a hyperinflation exploded. In a period of 15 months, prices rose by about 1 trillion percent. At its highest, the monthly inflation rate topped 30,000 percent!

### ***4. Poland***

Poland suffered substantial social and political turmoil when the end of World War I brought not peace but a continuing confrontation with Russia that only ended in 1920.

Poland was also a new state. After the partitions of Poland at the end of the eighteenth century, its pieces had been absorbed in the Hapsburg, Russian, and German empires, and Poland was re-created out of these pieces at the end of World War I. Poland suffered not only the birth pains of a new and fragile country patched together at the end of the war, it also bore the heavy costs of a war with the Soviet Union that lasted until late in 1920. Furthermore, the new state of Poland after World War I was left with an inexperienced civil administration after many of its prewar civil authorities left the country. Under these circumstances, Poland has run into a hyperinflation during 1922 – early 1924.

### ***5. Russia***

The Soviet Union was created in the most chaotic circumstances of all the new states founded after World War I. This country was established through a violent revolution and civil war that

followed upon Russia's costly participation in the War. The hyperinflation erupted as a result of monetary chaos in the wake of both economic devastation and the civil war.

### ➤ **The Aftermath of World War II: China, Hungary, and Greece**

The next round of hyperinflations occurred in the wake of World War II, when three widely separated countries, China, Greece, and Hungary, slid into monetary chaos. The same internally unstable conditions can be found in two of the three countries undergoing hyperinflation in the late 1940s. China and Greece were experiencing civil war, although this was not the case in Hungary.

#### **1. *China/Taiwan***

After nearly a decade of war with the Japanese, in 1945 China fell into a civil war between the Nationalist faction under Chiang Kai-shek and the Communist under Mao Tse-Tung. The heavy strain on the budget during the war became even more intense under the internal confrontation, and hyperinflation ensued. An interesting aspect of China at that time was the proliferation of currencies. There were several different currencies circulating in different areas controlled separately by Nationalist government and the Communist. Between 1947 and 1949, there were several separate hyperinflations in different currencies going on in parallel in China. After the Nationalist faction retreated to Taiwan in 1949, inflation came down from its astronomical levels, but still remained high for some time.

#### **2. *Greece***

A civil war also followed World War II in Greece. The Germans occupied the country from 1940 to 1944 and placed severe demands on the government, which were met increasingly by printing money. When the Germans were driven out by the British in 1944, a civil war exploded between the two main resistance groups: the monarchists and the communists, while noncommunists controlled the civil administration. Hyperinflation erupted in the midst of the civil war.

#### **3. *Hungary***

Hungary's hyperinflation during 1945-1946 is remarkable in two ways. First, it is the only country to have experienced two hyperinflations in the short period of 20 years. Second, it is the

highest hyperinflation in world history. Prices rose an astonishing 3.8 octillion times ( $3.8 \times 10^{27}$ ) in a mere one year, and the average monthly inflation rate was 19,800 percent. Hungary, which in the early 1940s allied itself with the Axis powers, had been an important battleground, and it lost an estimated 40% of its physical capital. As a loser of the war, it had to pay staggering reparations to the Allies, especially to the Soviets. After World War II, Hungary was another case of large effective reparations and occupation payments contributing to a fiscal crisis. It is calculated that reparation and occupation costs (payments to the occupying Soviet army) represented 25% to 50% of government spending in 1945 – 1946. One further explanation of Hungary's extraordinary inflation rate was its widespread use of indexed deposits and later of indexed currency. This practice shrank the demand for nonindexed money, which was the base of the inflation tax, and thus collecting a given amount of revenue required increasing inflation rates.

Hungary also fits the model of a weak government. Although the ruling party, the Smallholders, was elected with 60 percent of the vote in 1945, the country's sovereignty was severely compromised by the Allied Control Commission, led by the Soviet Union. When the central bank attempted to put the brakes on monetary emission, for example, the Commission refused to allow it.

### **Causes and Patterns**

The high inflations before 1980's seem to have a *similar pattern* worthy of consideration.

*First* of all, high inflations must always be preceded by major increases in the supply of money, and such huge increases in the money supply can occur only in systems with fiat money. Under metallic currency system, the supply of metals does not increase at rates necessary to produce high inflations or hyperinflations. It is only when governments abandon a metal standard that such high inflations are possible. Before the twentieth century, paper currency systems were rare, and indeed were often introduced for just such extraordinary circumstances as revolutions or civil wars. In normal periods, the inflation rate was held down by the link between money and the supply of precious metals.

*Secondly*, the role of civil war, revolution, or deep social unrest is clearly a factor in many of the hyperinflations, especially those before the 1980s. The strain on the public budget brought about by the financing of a war effort leads to major public deficits that eventually become monetized.

The government expenditure is significantly increased during the war, if the collecting taxes becomes extremely, in the absence of other alternatives, the difficulties of getting enough revenue thus makes the government turn to its printing presses to finance its budget.

*Thirdly*, the existence of weak governments has been pointed out as another important condition that triggers hyperinflation. A weak government can lead to internal unrest, which, in turn, feeds back and further weakens the government. In general, weak or inexperienced government lack the ability to enforce tax collection, and to implement necessary budgetary reforms. In addition, they are easily tempted to placate different groups of the population with transfers and subsidies in order to build up a political base. Under these situations, then, they are likely to turn to inflationary finance, and this sets the stage for high inflation.

## **II. C] – The debt crisis of the 1980s and the hyperinflation experiences in Latin America**

During the 20<sup>th</sup> century, a total of fifteen hyperinflations were experienced. Five occurred in Latin America in the following countries: Bolivia (1984, 18 months), Nicaragua (1987, 48 months), Peru (1988, 8 months), Argentina (1989, 11 months) and Brazil (1989, 4 months).

Before the debt crisis, in all these countries, large government spending, driven mainly by ambitious public investment programs and populist policies resulted in excessive fiscal deficits. It is important to note that the adoption of populist policies resulted from the fact that, in these countries there is a very unequal income distribution between very rich with enough political power to avoid heavy taxation and very poor who are in high demands for public spending. In this context, it is difficult to raise taxes to finance the deficit. This can be noted as an important difference with East Asia where income distribution has always been more equal. This can also be proposed as one of the explanations of why East Asian countries were less vulnerable to the consequences of the debt crisis.

During the pre-debt crisis period, heavy and easy foreign borrowing allowed the government to avoid inflationary finance. In 1982, with a persistent deterioration of the terms of trade and a sharp increase in world interest rates the countries faced a rising cost of servicing the debt while capital stopped flowing in. In this context, after depleting their foreign reserves, countries started relying more heavily on seigniorage.

Hyperinflation started first in countries that were experiencing a relatively more serious fiscal deficit and with fewer alternatives to finance the growing fiscal deficit. Two years after the debt crisis, Bolivia entered into 18 months of hyperinflation.

### **Hyperinflation in Bolivia**

Among all Latin American countries that experienced hyperinflation in the early 1980s, we have chosen the case of Bolivia largely because it was the first country to develop a full-blown hyperinflation in the early 1980s and the only case of successful stabilization of a hyperinflation in the 1980s.

In the first of the 1980s, Bolivia experienced an economic crisis of extraordinary proportion. Bolivia's economic debacle in this period was striking even in comparison with the poor performance of Bolivia's neighbors. The Bolivia's hyperinflation in 1984-1985 for example, was one of the most dramatic inflations in world history and one of the only hyperinflations that did not result from the dislocations of war or revolution. At its peak the monthly inflation rate reached 182.8 percent and lasted 18 months, between April 1984 and September 1985, recording 25,000 percent per year.

#### ***Main causes***

Like its neighbors, Bolivia suffered from *major external shocks*, including the rise in world interest rates in the early 1980s (the shifting in the US monetary policy), the cut-off in lending from the international capital markets, and the decline in world prices of Bolivia's commodity exports. But the extend of economic collapse in the face of these shocks suggested that internal factors as well have been critical to Bolivia's economic performance. Sachs<sup>2</sup> views the Bolivia's hyperinflation as "*the culmination of deep trends in the Bolivian economy and society, rather than the result of short-run forces in the early 1980s*".

The Bolivian hyperinflation had its roots in *weak fiscal budgets*. Importantly, Bolivia (unlike Brazil, for Example) did not have the institutional mechanism that produced inertial inflation. Wage indexation lasted until August 1985 and, especially in private firms and for qualified labor, wages were linked to the dollar in informal arrangements that were not legally binding. The labor

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<sup>2</sup> Morales and Sachs, 1989

unions have little experience in collective bargaining therefore there was significant erosion in real wages. Besides, between 1979 and 1982, there was an extraordinary internal political chaos, Bolivia emerging from military rule into democratic governance.

Inconsistency in conducting unsustainable macroeconomic policies was an important cause that contributed to widespread capital flight in the 1970s and 1980s in Bolivia. World Bank<sup>3</sup> gave some estimates of average annual capital flight (in millions of US dollars): 1971-75, \$77.3 (4 percent of the 1975 GDP); 1976-81 \$216.9 (6 percent of GDP); 1982-83, \$106.2 (3 percent of the 1983 GDP). Besides, bank deposits held by Bolivians in banks in the US were estimated to be around 10 percent of GDP. What were forces behind the capital flight: overvaluation coupled with expectations of devaluation is an important explanatory factor. In addition, illegal transfers to private individuals resulting from the mismanagement of public sector investments were likely to be exported to safe havens abroad. Their fears of expropriation or of controls on the free movements of capital have motivated a substantial portion of capital flight. A last explanatory factor might be referring to earnings from the coca trade that generated extensively capital flight, largely for non-macroeconomic reasons.

Having run out of foreign sources of finance, the Bolivian governments turned to its central bank. The *replacement of foreign financing by internal financing* to cover prolonged fiscal deficits was the most explanatory factor of hyperinflation. Thus, the key factor in starting the money printing (that is, increase a seigniorage up to 12 percent of GDP during hyperinflation period) was a shift in financing the deficit, from non-monetary means, mainly foreign borrowing, to monetary means.

It is true that the budget deficit rose dramatically as a result of increase in *cost of servicing foreign debt* but in fact Bolivia had already been running a large deficit even before 1982. As with other developing countries, Bolivia's access to foreign loans dried up in the early 1980s. Indeed, Bolivia led the way, falling into a foreign debt crisis a year earlier than the other countries did. But Bolivia has depended significantly on foreign saving to finance gross capital formation since the late 1950s. The bulk of that foreign financing has come in the form of medium- and long-term loans to the public sector. Unfortunately is hard to study the foreign debt of the Bolivian private sector because of a lack of adequate data, though available information suggests that the debt of the public debt is indeed by far the dominant form of external indebtedness. By

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<sup>3</sup> World Bank Annual Report, 1985

1980 Bolivia was already a highly indebted country – the debt-to-GDP ratio was 76 percent increasing to 111.8 percent in 1983 and to 111.9 percent in 1984. Once the interest rates increased sharply, arrears on amortizations of loans granted by private creditors started to build up. In spite of a debt rescheduling in 1981, the debt situation became aggravated; the net foreign resources transfers (net new lending minus interest payments) turned negative and a shift from external sources of finance to internal sources occurred, throwing the country onto the path of hyperinflation.

The most of the Bolivian external debt was related to the rapid growth of public mega-investment projects, which in turn were linked to a complex of political to and economic factors failing in the end to pay the necessary returns. Sachs<sup>4</sup> identified several of those factors: (1) the very short time horizon of Bolivian governments; (2) the use of state enterprises as a vehicle for political control; (3) the use of state enterprises as a conduit to monitor investment projects; (4) the overvaluation of the exchange rate, which led to a misallocation of investment spending into highly capital-intensive projects and which increased the budget deficits of the public enterprises; (5) the use of state enterprises as buffers for macroeconomics shocks.

In addition, there was a *misjudgment about the country's true macroeconomic situation*, as well as a failure to predict (along with the rest of the world!) the sharp swings that were to take place in the international economy at the end of the 1970s and the early 1980s. One part of the misjudgment came from the fact that Bolivia's strong economic performance in the 1970s reflected a temporary terms-of-trade improvement and the effects of the foreign loans themselves, rather than a true underlying improvement in economy.

### ***A possible pattern***

During the 1980s, the external shock that dented the budget was not war repatriations but the debt crises. The debt problem was certainly not the only factor behind the price explosion, but in some countries it was an important ingredient. All the countries that had in the 1980s or have now very high level of public debt (as a proportion of GDP) held by the government are more likely to experience episodes of high or hyperinflation especially if the external environment is unfavorable. Lessons from Bolivia must be read with care. The combination of the government loss of international creditworthiness and a large build-up of international debt with a weak

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<sup>4</sup> Morales and Sachs, 1989



domestic political instability, poor macroeconomic management, a weak tax system and a poor exports prospects, always seems to preclude a country from obtaining new international loans. Moreover if the foreign capital inflow dries up and the government doesn't adjust fiscal deficit (by increasing taxes or cutting expenditures or stopping domestic credit expansion), the rapid expansion of money supply (that is, printing money) cannot be avoided setting off the inflationary process.

With respect to international environment, the low interest rates on international loans were perceived as permanent when in fact they turned out to be temporary. As stressed by Morales<sup>5</sup>, the change in interest rates environment helps to account for the fact that overborrowing (and overlending by the banks) was a common feature of the entire world at the end of the 1970s and it might be happen again.

## **II. D] The transition economies. Yugoslav and Polish Hyperinflations**

For most people in former socialist countries, inflation was a stunning new phenomenon in the early 1990s. The communist type planned economy was designed to make the emergence of inflationary pressures impossible. In practice, however, one distinct feature of the transition experiences of these countries was that inflation was an integral part of their reform: transition began with a large, economy-wide price jump that was anticipated but greatly underestimated and in many cases prices increases became persistent. Therefore the hyperinflation in transition economies is more complex than the traditional phenomenon such as those of Europe in the 1920s. Hyperinflations in all former socialist countries<sup>6</sup> except Poland are more directly attributed to chronic (persistent) high inflation i.e., fiscal and quasi-fiscal deficits, unfinished reforms in enterprise restructuring, administrated prices and social transfer systems.

The particularities of high inflationary process in transition economies basically pose two faces:

1. why there was an initial large-economy-wide price jump in the liberalization that generates hyperinflation in some countries, and

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<sup>5</sup> Morales, 1982

<sup>6</sup> Armenia (1993-1994), Azerbaijan (1994), Belarus (1993-94), Bulgaria (1997), Croatia (1990), Georgia (1993-1994), Estonia (1992), Kazakhstan (1992-1993), Latvia (1992), Lithuania (1992), Moldova (1992-93), Russia (1992), Tajikistan (1993-94), Turkmenistan (1993), Ukraine (1993-94), Yugoslavia (1992-94) – Fisher, 2001

2. why inflation became an integral part and a sustained phenomenon that generates chronic inflation

For the purpose of this paper we will be focusing on the first problem considering that stabilization on the inflation front is an essential complement to the success of transition.

## 1. Hyperinflation in Yugoslavia

The hyperinflation in the federal Republic of Yugoslavia i.e., Serbia and Montenegro, was the second highest and the second longest episode ever recorded in economic period. At its peak, in January 1994, the monthly inflation rate reached 313 million percent (by a factor of  $3.6 \times 10^{22}$ ), which is second only to the most severe Hungarian hyperinflation ( $3.8 \times 10^{22}$ )<sup>7</sup> and lasted **24 months**, between February 1992 and January 1994, after the Russian hyperinflation in the 1920s, which lasted 26 months<sup>8</sup>.

### *Main causes*

The Yugoslavian hyperinflation was driven by excessive money supply that monetized various deficits that emerged upon the disintegration of the former Republic Yugoslavia and its common market.

The origins of the hyperinflation go back to the *main causes* discussed at the point A). Besides, *the Great Transitional Depression*<sup>9</sup> has followed after the Communist Curtin felt down, *escalation the fighting* in Croatia and Bosnia-Herzegovina and *rapidly deteriorating regional security situation*, led authority to postpone any orderly fiscal adjustment, particularly of expenditures. Also, a sharp decline in output as the result of the international embargo imposed by the United Nations was contributed to hyperinflation. In this respect, the Yugoslav hyperinflation is similar to the Hungarian hyperinflation of 1945-1946 during which there was a sharp drop in output to between 40-50% of the prewar level.

The *fiscal deficit* increased from 3% of GDP in 1990 to 28% in hyperinflationary 1993 and reached 71% of total expenditures, reflecting the inability or unwillingness of the authority to

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<sup>7</sup> but well ahead any other:  $10^{11}$  in China,  $10^{10}$  in Germany in the 1020s, etc. Cagan, 1987

<sup>8</sup> Cagan, 1956

<sup>9</sup> Kolodko, G, 2000

undertake the necessary fiscal adjustments in response to the severe shocks that caused a significant decline in output and external trade flows<sup>10</sup>.

*Significant monetization* of the fiscal deficit had already started in 1991. The seigniorage on base money was high throughout the 1991 to 1993 period at approximately 10% of GDP<sup>11</sup>, figure comparable for Bolivian hyperinflation.

Excessive increase in money supply was followed by a sharp *decrease in real money holdings*; the share of M1 in GDP decreased from 15% to 7%, 3% and 0.2% during hyperinflation. However the seigniorage did not decrease, although its monthly values displayed considerable variability<sup>12</sup>.

The replacement of domestic with foreign currency was accompanied by *almost complete dollarization* of the Yugoslavian economy. Economic decisions were based on current and expected exchange rate movements. On the other hand, money supply figures were known only to experts and with more than a month's lags.

The central bank *lost the overall control* over money creation. Money was also issued, although illegally, by the four regional central banks.

In fact only a fraction of the total increase in the money supply was used to cover the federal fiscal deficit. Central Bank credit to government covered the federal government budget deficit that accounted for only one-fifth of the total deficit. The remaining deficit was due largely to the deficit of the Republic of Serbia and to a much lesser degree to the Republic of Montenegro. Both republican budgets included large outlays for pensions, medical insurance and education. The bulk of money supply was to cover the regional budget deficits, but it was also distributed as soft loans to support production in large socially owned firms that were severely hit by the UN economic embargo. Accordingly, the money supply did not target the amount of revenue needed to cover the given fiscal deficit, as suggested by Sargent and Wallace but instead reacted in a disorderly manner while monetizing the large number of local deficits. Consequently, in the Yugoslavian hyperinflation one should not expect a money supply process that was well tracked by the path of inflation but rather an unpredictable one.

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<sup>10</sup> Bogetic and Vujosevic, 1995

<sup>11</sup> Bogetic and Vujosevic, 1995

<sup>12</sup> Petrovic and Vujosevic, 1996

In conclusion, the evidence supplied by now suggests that the money supply fueled Yugoslavia's hyperinflation by monetizing various deficits and that, in due course, control over money creation was lost.

### *A possible pattern*

The Yugoslav hyperinflation might be following the monetary view. Emphasizing the main role of fiscal shock in triggering an excessive increase in money supply to monetize the deficit the monetary model offers a better explanation and is more consistent with the Yugoslavian reality.

In the Yugoslav hyperinflation case two outcomes of the monetary view become important:

1) there is persuasive evidence of exchange-rate based pricing, i.e., the money fueled hyperinflation via exchange rate depreciation. Accordingly, this result suggest that prices might not be set in the money market, as stated by the monetary view, but rather that they were indexed to the exchange rate.

2) despite monetization of the fiscal deficit, the money supply was not endogenous i.e. it was to be predictable according to the path of past inflation.

Sargent and Wallace (1973) suggest that, the theoretical implication of fiscal dominance and rational expectations for hyperinflation is that the money supply process is endogenous. The problem in most hyperinflations, including the Yugoslavian one, is that the endogenous money growth cannot explain the runaway inflation associated with the large and growing fiscal deficit. Empirical evidence on money supply endogeneity in hyperinflation is mixed, i.e. endogeneity has been found in some hyperinflations but not in others. Furthermore, the endogeneity obtained for the famous German hyperinflation<sup>13</sup> has been questioned<sup>14</sup>. Cagan suggested that during hyperinflation, the money supply process might change in unpredictable way.

The Yugoslav hyperinflation was a combination of both outcomes. Bogetic (1999) demonstrated<sup>15</sup> that in spite of fiscal dominance, the money supply grew mainly exogenously (as suggested by Cagan<sup>16</sup>), i.e., non-predictably by either inflation or currency depreciation fueling currency depreciation, which in turn propelled inflation. The monetary regime followed a random

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<sup>13</sup> Sargent and Wallace, 1973

<sup>14</sup> Protopadikis, 1983

<sup>15</sup> and supported by econometric evidences (Bogan, 1994)

<sup>16</sup> rather than in a predictable, and hence endogenous, way as suggested by Sargent and Wallace (1973)

walk monetary standard<sup>17</sup> that was dominated by short- term decisions, economic current conditions and immediate political pressures and was highly unpredictable apart from an increasing trend. This is to say, money growth could not be predicted by either inflation or currency depreciation and, although it exhibited an increasing trend, its changes were unpredictable. The low predictability of money supply growth, on the other hand could explain tentatively the non-decreasing seigniorage noted in the Yugoslav hyperinflation, thus reconciling the monetization of fiscal deficits and lengthy hyperinflation.

In conclusion, money growth was weekly exogenous and affected inflation via currency depreciation. This indicated the presence of exchange-based pricing, whereas the exogeneity of money implies that money was the common trend fueling currency depreciation and inflation. Money growth itself followed a random walk with drift, which, together with its exogeneity, was a result of the Central Bank loss of control over the money supply process.

#### **IV. Hyperinflation in Poland**

The hyperinflation in Poland, the fourteenth occurrence in the world history<sup>18</sup>, was lasted only four months, between October 1989 and January 1990. At its peak, in January 1990, the monthly inflation rate reached 80 percent and had a ratio of prices of end to prices at start of 369 percent. The Poland hyperinflation is not “famous” by its magnitude but by its causes that named it “the only one socialist-type hyperinflation” – all other post-communist countries have experienced high inflations or/ and hyperinflations as integral part of their transition reform. Thus the Polish hyperinflation got more political rather than pure monetary connotation. In fact Poland’s hyperinflation had an important and peculiar characteristic. In a normal market economy, a monetary expansion produces a broad-based increase in prices. In Poland, during the socialist era, prices increases in most sectors were blocked by official controls on price, administered by Ministry of Finance. In these sectors, the monetary increase produced shortages and queues on the official markets, and an increased resort to black markets, on which prices soared. Thus the Polish hyperinflation was a mix of open inflation and repressed inflation, with soaring black-market prices, a more than generous wage indexation scheme that fueled the wage inflation, a large increases in subsidizes and a growing resort to illegal trade and barter.

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<sup>17</sup> meaning that that the uncertainty of forecasts grows exponentially with the distance from the present (Heymann and Leijonhufvud)

<sup>18</sup> Sachs, Jeffrey (1994)

### ***Main causes***

Analyzing the main causes that fueled hyperinflation before the new government was embarked we have to go back to *general description* discussed above (pct. A).

Besides, the Poland hyperinflation had *particular causes* derived from a specific economic and politic environment unique among other former communist countries: Poland was the country with the most considerable liberalization and reforms before 1989 comparison with all Eastern European countries. In spite of this “easier” post-communist inherited burden, the country was turning into hyperinflation as a final legacy from the Communist government. In other words, the Poland hyperinflation is a “socialist-type” product. Several particular causes deserve to be discussed below:

First and the most important cause triggered other negative factors that contributed to the hyperinflation through a complex vicious circle. In contrast with the other East European countries, most of the Polish farm remained in private hands, but the regime, *fearing the rise of middle (“kulak”) class*, adopted policies that retarded modernization by keeping the farms artificially small. Food production increased more slowly than urban demand, causing shortages. Past attempt by authorities to raise prices triggered “bread and freedom” riots. The government “solved” the problems increasing food and animal feeds imports and by granting subsidies to farmers. The private sector reform failed because the authorities were much too cautious in creating a real market environment and because they were generally hostile to real privatization of the socialist economy.

Second, the mounting *subsidies* were the cause of increasingly large fiscal deficit, all financed by money creation. Large subsidies were also given to the mining industry to keep down production and heating costs (coals being the main source of heat and of energy of Polish industry) and to housing. For instance, coal prices were so low that private gardeners profitably grew hothouse tropical flowers for exports.

Third, the hyperinflation was fueled by the *wage-price mechanism*. With a huge excess demand and a massive increase in subsidies, the authorities had to raise prices giving in meantime to demands for higher wages that finally generated inefficiency and low productivity. Enterprises that found themselves in financial troubles as a consequence of were given subsidies. Wages

soared merely creating an even higher excess demand and a massive intensification of shortages rather than an increase in real purchasing power and standard of living.

In addition to a huge increase in prices, money-financed budget deficits, and shortages, Poland suffered from a range of several *international finance problems*. Most immediately, the balance of payments was collapsing as imports were running rapidly ahead of exports, draining reserves at the central banks. The black market exchange rate was several times the official exchange rate, a phenomenon that imparted a profound anti-export bias to the economy (exporters received fewer slotys per dollar of export earnings than they would have received in the free market for foreign exchange; thus the incentive for exports were diminished). Poland's foreign debt, at around USD 40 million, was not being serviced. The country simply could not sustain the payments and so was in default to all of its international creditors.

Defeated at the polls (also a unique characteristic for the former communist countries), deprived of Soviet military support, unable to cope the economic situation, the Communist Party surrendered power in September 1989.

When the government attempted a drastic reform by cutting farm subsidies and freeing most of the food prices, the economy turned into hyperinflation (October 1989).

During the closing months of 1989, the Solidarity-led government took important preparatory steps by (1) making drastic budgetary cuts to reduce hyperinflation; (2) devaluating the national currency by 75 percent in real terms; and (3) making important institutional changes. Then, on January 1, 1990 the government introduced a multifaceted package of reforms backed by the IMF and the World Bank whose main goal was to reduce the budgetary deficit from 7 percent of GDP in 1989 to 1 percent in 1990 (in fact was a slightly budgetary surplus).

The price response to the tough macroeconomic measures was dramatic: in January 1990 the CPI rose by 80 percent, by another 24 percent in February, but in March by only 4 percent. The hyperinflation was over, but until mid-1991, prices continued to rise at a two-digit annual level until 1997.

### ***A possible pattern?***

Due the specific and unique political system particularities described above, the Polish hyperinflation cannot precisely describe a traditional monetary pattern as in the Yugoslav hyperinflation. In our opinion, as long as the humanity have learnt the lessons offered by the one

of the greatest disasters in the twentieth century – the dictatorship of the proletariat – the socialist-type hyperinflations are unlikely to reappear too soon in the future history.

## CONCLUSIONS

The purpose of this paper was not to give a general description of hyperinflation phenomenon but to examine the circumstances, which lead to hyperinflation during the 20<sup>th</sup> century.

We have tried to argue that if inflation is always and everywhere a monetary phenomenon then hyperinflation is always and everywhere a quasi-fiscal phenomenon. Monetary factors alone do not explain hyperinflation. Their interrelation with fiscal factors must be taken into consideration.

Then we have tried to figure out some possible patterns that occurred in the last century, in three different contexts: (i) after the two great wars, (ii) in the aftermath of the debt crisis and (iii) during the transition in Eastern Europe. The transmission mechanism is the same in all three cases: the colossal increase in money supply (that leads to hyperinflation) generally results from the need to finance a huge budget deficit. In essence, the theoretical approach is just an historical repetition because hyperinflation describes the shifting in financing budget deficit from non-inflationary to inflationary means under different shocks i.e. (i) war repatriations, (ii) external and internal unfavourable environment or (iii) the socialist economic system collapse.

A big question remains unsolved: why hyperinflation has necessarily occurred in certain times and in certain places? We have just tried to argue that there is only one hyperinflation phenomenon that have appeared in those periods of time and in those places where a strong and very well-determined economic and/or political system has been developed; its collapse triggers economic and/or political distresses and hyperinflation might be one of its components.



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