Hyperinflations

The experience of the 1920s reconsidered

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Acknowledgements

This is a revised version of my Ph. D Dissertation originally presented to the Department of Economics in Harvard in 1986. Its main purpose was to join my interest in economic history and the ambition to extend and develop some of the new ideas and insights produced in connection with the recent experience with high inflations and stabilization policies in Latin America. Before and after my stay in Cambridge I worked in the Economics Department at the Catholic University in Rio de Janeiro (PUC-RJ) thus with a group of economists that played a major role to the development and application of these new ideas. The constant interchange of ideas and assessments of the current experience was an invaluable source of insights and suggestions. I own special thanks to the group as a whole and very specially the members of my thesis committee at Harvard - Jeffrey Sachs, Barry Eichengreen and Lance Taylor - for their constant encouragement towards a sensitive and rigorous use of economic analysis in understanding history, which I took as a lesson of a permanent character. I should also thank Stephen Marglin, who was very helpful through the steps preceding the writing of this dissertation and Edward Amadeo for help framing this project and devising its relevance. Early presentations at various seminars at Harvard help maturing ideas, I owe special thanks to Susan Vitka and Stephen Haggard for that. I am deeply indebted to my friend Laurent Jacob for sending me otherwise unavailable materials from Europe and Kris Glushowski for sharing with me a vivid picture of Poland in the 1920s. Numerous other seminar presentations in Cambridge and in Brazil, where hyperinflations have become a subject of day-to-day conversation, have improved this work in many respects. Earlier versions of some chapters - 4, 7 and 10 - circulated as working papers and were published in academic journals in Brazil (*Pesquisa e Planejamento Econômico* and *Revista Brasileira de Economia*) and abroad (The Economic Journal and *Rivista di Storia Economica*).

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Chapter 1

General introduction and outline

1.1) Issues and Views on the Hyperinflations

Hyperinflations are very rare phenomena; less than ten cases have ever been registered in which the 50% monthly inflation threshold has been crossed[1], and, at least before the 1980s, only in a few episodes inflation even approached comparable levels. In most cases its occurrence was related to very exceptional circumstances - wars, revolutions and major dislocations - thus conveying the impression that hyperinflations are highly unusual pathologies to be found only in such conditions. Yet, they have attracted an enormous amount of attention; like a rare variety of a common disease, they command great scientific interest. The "extreme case" makes more transparent the ultimate nature of the phenomenon, and thus furnishes some useful keys for day-to-day medicine.

The interest on hyperinflations would be reinforced during the mid 1970s, with the worldwide surge of inflation, and especially in the 1980s when one sees concrete indications of the rare disease becoming epidemic. The experience of inflation in LDCs, and especially in Latin America, has come very close to the hyperinflation norm - the 50% monthly rate; in at least one country, Bolivia, the threshold has actually been crossed and at the moment of writing (1989) inflations in Argentina and Peru are just about to do so. More importantly, however, the many similarities between the recent experience and the "classic" cases has led observers, on one hand, to recast the idea that hyperinflations are creatures of times of revolutions, wars and the like, and on the other, to reconsider the very concept of hyperinflation. Indeed, "hyperinflation" is just another word in the economist jargon to designate "high inflation" and, as recently observed by Cagan himself, it should be nothing more than "an extremely rapid rise in the general level of prices of goods and services" and that "there is no well-defined threshold" to characterize it[2].

The impression that there is little qualitative difference between the recent Latin American cases and the "classic" ones, has turned the latter into an invaluable source of lessons and recipes. From the academic point of view this renewed interest in the "classic" experiences would result very fruitful since an enormous amount of research on inflation and stabilization policies done from the mid-1970s on has produced many new insights, new models and ideas on the nature of high inflations and on stabilization policies; "the

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[1] Five of which, during the 1920s, three after the World War II and a more recent one in Bolivia.
[2] J. Eatwell *et al*. (eds) (1987) vol. 2, p. 704.

only boon from economic hardship is this outburst of thought"[3], as put by a leading contributor in this field. These developments opened many new possibilities as regards a revision of the hyperinflation experiences in light of powerful new analytic instruments and a clearer understanding of the nature of the inflationary phenomenon.

1.1.1) "Schools of thought"

The visions on the hyperinflations went through several phases, the first of which was one of controversy. During the 1920s until the late 1930s there was a lively debate on the origins of the hyperinflations confronting what has been called the orthodox, or the "English", view - holding that inflation was generated by unbalanced budgets and excessive money creation - and the balance of payments interpretation, or the "German" view, of the hyperinflations attributing the phenomenon mostly to the unbearable external imbalance created by the payment of war reparations[4]. This controversy was actually much more than simply an academic dispute: it lied in the very core of the intricate diplomacy of reparations. For this reason the balance of payments view has not enjoyed much popularity in the English-speaking world; after all, it was a "German view", and this was no trivial stigma in the 1920s and in the following decades. It is significant, however, that the "balance of payments theory" of the hyperinflation was held also by some distinguished scholars - unsuspected of unorthodox or Germanophile leanings - such as, for example, John Williams and Frank Graham in the United States and Bertrand Nogaro and Charles Gide in France[5].

Yet, these and other defenders of the balance of payments theory have not actually succeeded in providing a comprehensive and clear alternative to the "English" explanation, mostly because the connection between inflation and the burden of an impossible transfer, or from deep external imbalances, was not explored in a convincing manner. The transfer debate, represented for example by the celebrated Keynes-Ohlin exchange, was more or less divorced from the discussion of the origins of the hyperinflation and rapidly evolved towards issues solely of theoretical interest. It is significant as an indication of the omission of any link between adjustment and inflation that, for example, it was often argued during

[3] L. Taylor(1986) p. 1.
[4] On this debate see K. L. Holtfrerich (1986), G. Merkin (1982), C. P. Kindleberger (1984) pp. 310-311, K. E. Born(1977) and M. de Cecco (1983).
[5] See G. Merkin (1982) for a more comprehensive listing. See also J. Williams (1922) and B. Malamud (1983).

the early transfer debate that the adjustment necessary for the transfer of reparations required reductions in the "standard of living"[6], but the fact that the capacity of workers to resist such endeavors could make adjustment more difficult and could have serious inflationary repercussions is barely mentioned. This is somewhat surprising since there were strong reasons to believe that workers' capacity to resist wage cuts had been enormously increased by the early 1920s for a number of reasons. This might have been very important, as far as hyperinflations were concerned, for external shocks under "rigid" real wages can have very serious inflationary repercussions[7]. Possible wage rigidities were hardly mentioned in the hyperinflation debate; a possible role for wages was only briefly mentioned in Joan Robinson's review of Bresciani-Turroni book[8] and much more recently in an entirely different context by Karsten Laursen and Jørgen Pedersen[9]. The wage issue, in fact, is one of many possible links between external adjustment and inflation; it has been extensively researched in connection with the experience of the 1980s and there is no reason to imagine it less relevant in the 1920s.

The victory of the "English" view was by no means exclusively an outcome of the academic debate. The notion that the problems faced by Germany and other troubled economies in the aftermath of the war were purely financial, or that "fundamental imbalances" would be automatically corrected as soon as the adjustment machinery of the gold standard was restored, would come to play a very essential role in shaping policies of the core economies towards the reconstruction of the international economy and their specific attitudes towards the stabilizations of individual countries. These attitudes resulted very damaging especially in the cases of the new Central European republics created in Versailles - three of them experiencing hyperinflations. These economies would face extraordinary problems of adjustment to their new frontiers and economic realities, which would be completely ignored by authorities conducting the process of international stabilization and judging on stabilization loans and related conditionality. The sequel of this overemphasis on "sound finance", and related *laissez faire* notions, was to preserve a

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[6] Nowhere more dramatically and persuasively than in the original entry in this debate, namely J. M. Keynes (1920).
[7] See, for example, L. Taylor (1979), W. H. Branson & J. J. Rothemberg (1980); T. Gylfason & A. Lindbeck (1984); E. Bacha & F. L. Lopes (1984); A. Canavese (1982); S. G. Turnovsky (1979); F. Modigliani & T. Padoa-Schioppa (1978) and more specifically in this context C. P. Kindleberger (1985).
[8] J. Robinson (1938) p. 510.
[9] K. Laursen & J. Pedersen (1964).

substantial degree of non-adjustment which would result disastrous a few years later when the abundance of foreign loans, which was to a great extent responsible for the maintenance of the gold standard in these countries, came to an end. The lesson was shown to be learned many years later, at the aftermath of the Second World War, as it was clearly perceived that the solution for external imbalances was an essential pre-requisite for stabilization and for the rebuilding of a healthy world economy. Yet, this demise of "sound finance" in the years of high Keynesianism would last little, as just a few years later the Bretton Woods institutions could be found preaching "sound finance" just as if nothing had happened. Conflicts regarding the emphasis on "structural adjustment" and financial issues as pre-requisites to stabilization and adjustment would be present during these years and even more clearly after the oil shocks and the debt crisis.

Meanwhile, in the academic world the apparent victory of the "English" view would be reinforced in the late 1950s by the publication of Cagan's seminal work at the onset of the monetarist counterrevolution[10]. The empirical stability of the money demand relationship would play a pivotal role in establishing the new monetarist paradigm and Cagan's study was possibly the most impressive and the most important contribution in this respect. With the increasing popularity of the new theory, and eventually with the incorporation of major elements of the new paradigm into mainstream economics, Cagan's study was raised to the position of the established view on the hyperinflations. Yet, Cagan's model does not seem to enjoy consensus when applied to "ordinary" inflations. It is quite curious that most economists with pragmatic views on inflation seem to feel comfortable with Cagan's model only when considering hyperinflations.

The experience of the early 1980s did much to blur the frontier between what should be conceded to pure monetarism and what should be explained by other influences. In general the attitudes about the semi-hyperinflations of the 1980s have been careful and ambivalent; very few really attributed these inflations exclusively to money creation or seigniorage collection motives. This is not merely a product of economists celebrated pragmatism: the external shocks of the 1970s and 1980s have been flagrant enough. If the semi-hyperinflations of the early 1980s have been generated to a great extent by non monetary shocks then it is perfectly conceivable - in light of the extensive list of suggestive similarities between the 1970s and the 1920s, including large transfers, debts, external shocks, flexible exchange rates and high inflations[11] - that the latter might have played a very important role in the 1920s.

1.1.2) Stabilizations

More important, as a practical matter, than the origins of the hyperinflation is the making of stabilizations. It is very essential to note in this connection that the knowledge of its fundamental causes might not be all that is necessary to explain the end of the hyperinflations. This was a crucial insight of the 1980s: since high inflations display a markedly auto-regressive character - the "inertia" phenomenon - the transition to price stability was made difficult by the fact that, at any moment, the rate of inflation was to a great extent pre-determined. The nature of inflationary “inertia” is a crucial issue for the effectiveness of stabilization policy especially as far as high inflations are concerned. It generally involves an unclear mix of institutional factors, uninformed expectations and strategic interaction.

The failure to deal with "inertia" issue seems to be the cause of the repeated failures of "orthodox" stabilization programs in the high inflation environment. Solving "fundamentals", in itself, usually does little to dissolve inflation, which is maintained by mechanisms such as backwards looking indexation, staggered contracts and problems related to coordinating wage and price restraint. By the same token, the successive failures of the so called "heterodox" stabilization programs in Latin America in the early 1980s left clear that addressing the "inertia" issue alone provides but temporary success if "fundamentals" are not addressed. In sum, the experience of stabilizing high inflations in the early 1980s has led most observers to agree that the problem of stabilization has a dual nature, it involves both "fundamentals" and "inertia", none of which sufficient in itself to assure a successful stabilization.

The sudden ends of the hyperinflations are perhaps the most extraordinary episodes of disinflation ever registered. This is a basic and trivial consequence of the fact that in a fully dollarized economy - like the hyperinflation economies came to be - domestic inflation becomes identical, or at least very close, to the rate of currency depreciation, so that with the fixing of the exchange rate inflation stops instantaneously. The process of

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[10] P. Cagan (1956).
[11] See for example T. Balogh & A. Graham (1979), R. Aliber (1980), J. A. Frenkel (1978) and A. Fraga (1984).

dollarization plays, of course, a crucial role in acting as a coordination mechanism governing all pricing and wage setting decisions in the economy. It should not be seen only as the extension of the use of foreign currencies as inflation hedges; it advances as an extension of the indexation experience - or the reckoning of real values in terms of an index - that gains an extraordinary impulse in high inflation conditions. Dollarization basically means that the unit of account function of the national money is surrendered to the exchange rate, thus effecting a *de facto* coordination of all pricing decisions around one single index, which was exactly what allowed such extraordinarily sudden ends to the hyperinflations.

The more recent rational expectations explanation for the sudden end of the hyperinflations, have focused on a quite different mechanism. Thomas Sargent has argued that the sudden disinflation was determined by drastic, sudden and synchronized collective revision in expectations determined by fundamental changes in fiscal policy assuring the end of inflationary finance[12]. Despite the fact that Sargent does not offer much documentation on the nature of fiscal measures taken in order to support his claim, his explanation for the stabilization has come to play, as regards the understanding of the stabilizations, a role similar to the one played by Cagan's model as regards the causes of the hyperinflations: it is by no means accepted as a general picture of stabilizations though accepted up to a certain point as appropriate to the "extreme" cases[13].

The mechanisms underlying the stabilizations are the most important single issues for policy-makers of our days. It is easy to see, upon a close examination, the stabilizations as produced by a combination of many factors. They involved the development of dollarization as a mechanism to dissolve "inertia", a solution for "fundamentals" - which included usually the transition to a manageable fiscal position and measures towards external imbalances, such as debt rescheduling, large external loans and even additions of territory - and also more usual demand management policies. There is no reason to presume that any one of these elements would suffice to account for stabilizations; the great policy achievement was the engineering of this combination.

[12] T. Sargent (1982) p. 57.
[13] Moderate versions have been recently offered in which some of the assumptions are relaxed but the most important ones, namely those referring to "fundamentals" and to the way the "inertia" problem was solved are basically the same. See for example R. Dornbusch(1985) and S. Webb(1985a).

1.2) Plan of the work

This work attempts to reconsider the fundamental determinants of four of the hyperinflations of the 1920s - Austria, Germany, Hungary and Poland - and also the process by which such inflations were terminated. These hyperinflations evolved in a very similar historical context and provide vast material for comparative analysis. Other hyperinflations, such as the ones after World War II for example, took place in entirely different circumstances and it would require a major effort only to set up the proper context in which to compare these experiences with those of the 1920s. This is also true for the hyperinflation in the Soviet Union in the early 1920s for it was simultaneous with the most critical phase of the process of transition to socialism. The Soviet case seems a fascinating research project, but the issues involved are very specific, at least in the sense that it adds little in terms of comparative analysis.

This work is divided into two parts: the first, comprising Chapters 2 to 6, is concerned with the historical context and the determinants of inflation and the second, that includes the remaining chapters, addresses different aspects of the stabilization experience. The work is oriented towards major issues - as opposed to a chronological or country specific presentation - and its purpose is basically to select issues relevant for the discussion of the current high inflation experience, or to draw lessons of a more general interest. In this connection, much attention is devoted to the definition of the proper historical and institutional context so as to control for these factors in drawing such lessons. That, on the other hand, might result troublesome for the reader unfamiliar with these countries histories as far as distinguishing dates and places in four different countries is concerned. In this regard the next section brings brief chronologies of events and charts with the postwar evolution of inflation in all four countries.

Within the first part, the first two chapters are historical while the other two are essentially analytical. Chapter 2 starts from a broad perspective offering an account of the attitudes prevailing in the 1920s as regards external imbalances and financial issues in the context of the problem of international reconstruction and stabilization following the First World War. It is argued that the assumption that the rebuilding of the gold standard would suffice to restore external balance on each individual country and a healthy world economy was the basic guideline for international action towards the stabilization of the hyperinflation economies, and that it resulted in preserving imbalances to be uncovered only later in the 1920s when the international lending *bonanza* came to an end. The contrasts with the experience of adjustment-stabilization following World War Two is very rich and it is briefly discussed to illustrate the shift in emphasis towards structural adjustment *vis à vis* "sound finance".

Chapter 3 is more directly concerned with specific imbalances present in the hyperinflation economies. These problems are shown to stem mostly from the Peace Treaties, which redrew the Central European map according to criteria that were only partly informed by the economic viability of the new countries. The German problem is shown to be of a different nature, namely related to the payment of reparations. It is argued that the burden of reparations was indeed very heavy - thus challenging the analysis of a number of authors - and turned even harder by the determination of a considerably strengthened labor movement not only in resisting wage reductions but also in recovering pre-war levels of real wages. This "inconsistency" should be seen as a major factor in generating inflation, as explored in great detail in Chapter 5.

Chapters 4 and 5 are mostly concerned with alternative models for the determination of inflation. Broadly speaking, they attempt to assess the explanatory power of models typical of the different "schools of thought" on the determination of hyperinflation. Chapter 4 discusses monetary models of high inflation and their application to these specific episodes. The evidence presented - mostly related to the patterns of seigniorage collection in these episodes - leads to the basic conclusion that non-monetary influences seem to have played the dominant role, or that money played a passive role in these episodes. In Chapter 5 a model is developed highlighting the inflationary repercussions of adjustment problems under wage rigidities - or the "vicious spirals" created by inconsistencies between the requirements of external balance and the demands of the labor movement - in the presence of flexible exchange rates and inflationary inertia. No claims of generality are made with respect to this model, though it is indeed argued that it describes very well these hyperinflation experiences in their very historical context. A crucial feature of this model is that inflation is not explosive, it cumulates shocks onto a process with "memory", which is indeed the case of all episodes, excepting the last four months of the German inflation when something of a different nature seemed to interfere with the dynamics of inflation, namely the introduction of indexed monies, as seen in

Chapter 10.

The second part of this work - treating the process of stabilization - comprises a discussion of the advance of indexation and dollarization as a vehicle for the solution for the inertia problem and also an analysis of the difficulties in handling "fundamentals" in each case. Chapter 6 starts by providing documentation on the historical and institutional issues involved in the adoption of indexation in the hyperinflation environment and how this process degenerated into a process of dollarization. As a prelude to the more detailed treatment of each individual stabilization case in the following chapters, Chapter 6 develops an application of the model of Chapter 5 to illustrate the basic mechanisms underlying the individual stabilizations. It discusses the effects of fixing the exchange rate under dollarization, the choice of parity to be defended, the behavior of wages and international reserves, and the role played by external loans and also by fundamental improvements in the country's external position, which could allow the reconciliation of target wages and external balance.

Chapter 7 plays a very important role in this work for it complements Chapter 4 in providing a case against the Cagan & Sargent view of the hyperinflation episodes. Chapter 7 examines in detail the fiscal "reforms" that were implemented during the stabilizations and discusses their role in reordering these countries finances. Its basic findings include the fact that inflation influenced tax collection to such an overwhelming extent that price stability by itself would bring budgets to a near balance and in some cases even to a surplus. It is also shown that, even for the countries subject to the Draconian discipline of the League of Nations intervention, expenditure cuts played a minor role for balancing these countries budgets. For Poland in particular the stabilization was not even accompanied by budget balance; much on the contrary sizeable deficits financed by money creation were observed and this did not seem to interfere with the stabilization. In light of this evidence, Chapter 7 questions the role actually played by fiscal "reforms" in these stabilizations for the "inflation-corrected" deficits seemed either very small or outright inexistent.

The next three chapters refer to the final act of each stabilization episode, thus focusing on events associated to the fixing the exchange rates, its effects and the mix of measures taken to sustain the exchanges. Austria and Hungary are considered together in Chapter 8 for in both cases a large loan under very strict conditionality sponsored by the

League of Nations was the key aspect of the stabilization. Given that the fiscal problem was solved by the effect of price stability on tax revenues, there lacked, as regards "fundamentals", a "permanent" improvement in these countries' balance of payments necessary to reconcile external balance with the demands of the labor movement. This role would be played by the large stabilization loans floated under the League auspices and the inflows of foreign capital that followed. In both cases real wages would recover very quickly after the stabilization, as "predicted" by the model of Chapter 5, and the implied deterioration in competitiveness, and the associated development of a large current account deficit, could be accommodated by continuously borrowing abroad. For Hungary in particular it is argued that the authoritarian government that ruled during the 1920s created the possibility of blocking the recovery of real wages, an option unavailable to the other countries. The key issue for these countries was how to address the structural problems created by the new frontiers when the League's priorities were only associated with financial issues; the tensions between austerity and adjustment are very clearly observed, especially in Austria.

For Germany and Poland it is also true that the access to international capital markets in the second half of the 1920s was the factor that allowed the reconciliation of wage demands and external balance with no resort to unemployment. But in both cases the stabilization was accomplished before foreign capital was made available in significant amounts, and in both cases special circumstances would explain that. The Polish experience discussed in Chapter 9 differed from the ones under the League control mostly by virtue of the priority assigned to investment spending connected to issues of strategic interest (railways) - seen as essential for nation-building and political balance in the region - from which one explains the lesser importance given to budget balance. Probably in view of this, the Poles access to foreign finance was reduced. Just like the other countries, however, real wages in Poland recovered very significantly after the stabilization, producing a deterioration in the current account that slowly eroded international reserves leading the zloty to float one year and half later. Only then, when the hyperinflation was no longer an issue, the Poles could successfully float a large stabilization loan and enter the borrowing *bonanza* of the late 1920s. Their previous concern with adjustment, however, would make Poland much less vulnerable in the late 1920s than the League countries to the vagaries of the international economy; Poland withstood the shocks of the late 1920s without even abandoning the gold standard.

The German stabilization, treated in Chapter 10, is surely the most fascinating case, which is mostly due to the *rentenmark* experiment. Chapter 10 devotes special attention to the experience with the "stable valued currencies", or "indexed monies", in Germany and its consequences. It is argued that the dissemination of such monies determined, on one hand, the inflationary explosion observed after June of 1923, but opened up, on the other, the possibility of a large issue of an official "indexed money" which came to be the *rentenmark* . Thus, Chapter 10 offers a solution for the old enigma of why the *rentenmark* was accepted as hard currency despite its having no real “backing” in foreign currencies or gold. The *rentenmark* would play an essential role to the effort of fixing the exchange rate while the reparations issue was unsettled; it would work just like a external loan that would accommodate the deterioration in the current account provoked by the sharp recovery in real wages observed after the stabilization. Chapter 10 discusses the role played by other factors - interest rates for example - and also alternative view on the German stabilization.

No overall conclusion is actually offered; only a brief "moral" of the story is given in the epilogue.

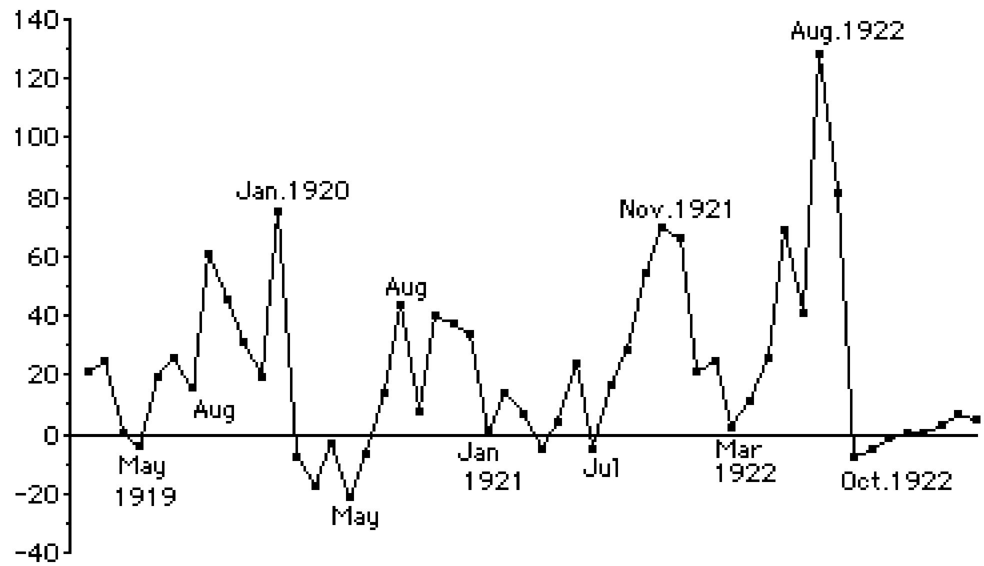
1.3) <u>Chronologies</u>

1.3.1) Austria

1918 *November* . Austrian Republic established.
1919 *March* . Stamping of Austro-Hungarian banknotes within new Austria. Socialist Foreign Minister Otto Bauer offers to Germany an immediate monetary union. Schumpeter Finance Minister.
June . First draft of Peace Treaty (St.-Germain-en-Laye) handed to Austrian delegation establishing reparations liability, new frontiers, distribution of Empire's debt and liquidation of central bank.
September . Final text of Peace Treaty. Cabinet fell, Schumpeter and Bauer resigned.
November . Renner government proposes introduction of partial wage indexation.
December . Chancellor Renner's appeal to the Supreme Allied Council for financial help denied.
1920 *February* . Austrian Section of the Reparations Commission established.
June . Socialist withdrew from Cabinet, and capital levy waived.
1921 *January* . "Goode Scheme" proposed by Reparations Commission.
March . Chancellor Mayr appeals to Supreme Allied Council for financial help under Ter Meulen terms.
June . League of Nations' experts report of Austrian stabilization prospects.
July . Paris edition of the Chicago Tribune announces breakdown of League plans causing panic in Vienna.
October . Socialists(Otto Bauer) present plan for reconstruction.
November/December . Food subsidies mostly abolished.
1922 *February* . British government extends a credit of £2.0 million to Austria.
May . Empowered conservative chancellor Ignaz Seipel.
August . Seipel appeals to the Allies for financial help. Lloyd George refers the matter to the League of Nations' Financial Committee to elaborate scheme based of 1921 experts' report.

October . Protocols defining League scheme signed at Geneva.
November . Emergency powers law passed by Austrian Parliament.
November/December . Austrian banks subscribe internal loan.
December . Commissioner-General arrives at Vienna.

Chart 1-1
Austrian inflation: 1919-1923
(monthly rates)



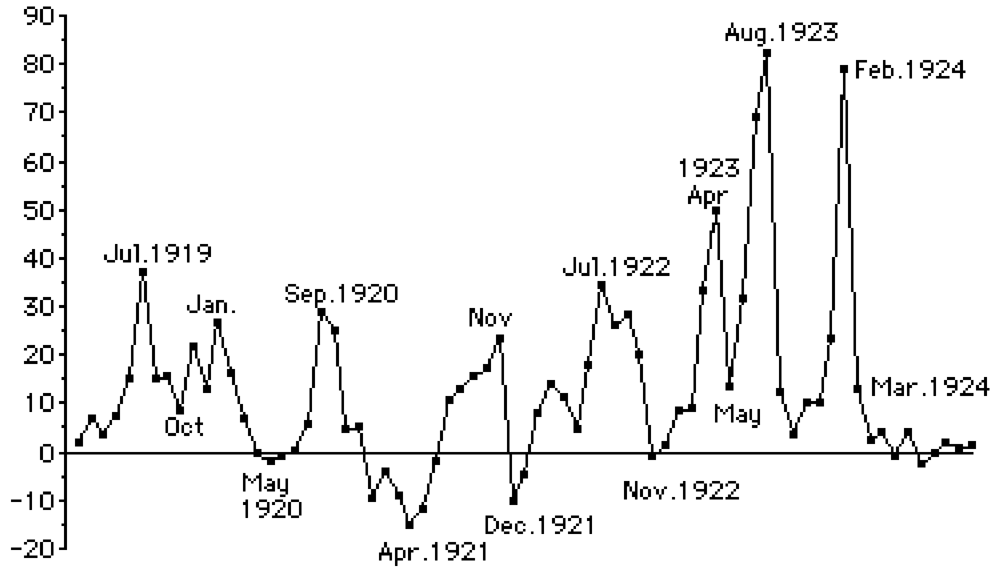
SOURCE and OBSERVATIONS: For 1919-1920 figures are for exchange depreciation, for 1921-1923 figures are for inflation computed from retail prices. From J. van Walré de Bordes(1924) pp. 82-83,115-117.

1923 *January* . New bank of issue starts operations.
February . £3.5 million short term advance over reconstruction loan placed.
March/June . Reparations Commission and holders of relief bonds suspend all liens on Austrian property.
June . Reconstruction loan floated.

1.3.2) Hungary

1918 *October* . Hungarian independence.
1919 *March* . Bolshevik government under Bèla Kuh.
June . Romanian invasion.
August . Right wing government established under Admiral Horthy.
September . Final text of St. Germain-en-Laye Treaty establishing new frontiers, reparations obligation, distribution of Empire's debt and liquidation of central bank.
1920 *March* . Stamping of Austro-Hungarian notes within Hungary and attempted stabilization through confiscation of notes.
November . New stabilization attempt under finance minister Hegedüs.
1921 *June* . Hegedüs resigned.
1922 *October/December* . Exchange rate stabilization attempted by exchange control institute.
1923 *April* . Appeal to the Reparations Commission to raise liens on Hungarian property.
September . League of Nations asked to start preparatory work for financial reconstruction.
October . Reparations Commission officially invites League to draw stabilization plan.
November . League's experts in Budapest.
December . Experts report to Financial Committee of the League.

Chart 1-2
Hungarian inflation: 1919-1924
(monthly rates)



SOURCE and OBSERVATIONS: Figures are for wholesale prices from E. A. Boross(1984) pp. 224-226 and L. L. Ecker-Rácz(1933a) pp. 61-62.

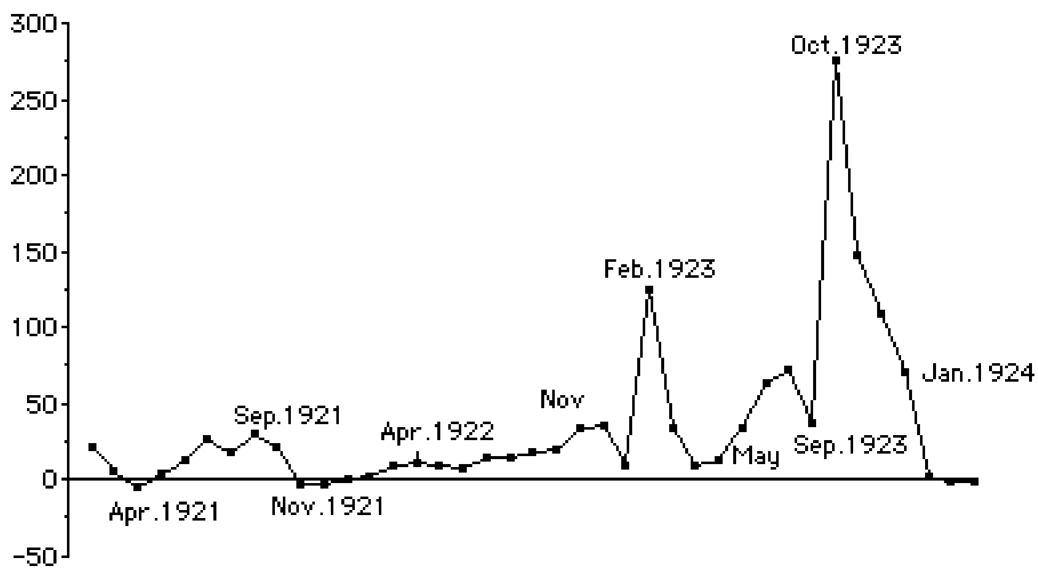
1924 *January/February* . Collapse of Vienna Bourse transmitted to Budapest generating financial crisis.
March . League delegation in Budapest to draw reconstruction law. Protocols defining League scheme signed in Geneva.
April . Reconstruction Law adopted by Hungarian government. Advance from Hungarian banks to government. Subscription of new bank of issue opened.
May . Commissioner-General arrives in Budapest. Forced domestic loan.
June . New bank of issue starts operations.
July . Reconstruction loan floated.

1.3.3) Poland

1918 *November* . Polish independence.
1919 *May/September* . Versailles and St. Germain-en-Laye Treaties establish new frontiers, Dantzig as a "free city", and plebiscites to be held in Upper Silesia and East Prussia.
November . Currency unification, creation of the Polish mark.
1920 Polish Soviet war.
1921 *March* . Peace of Riga (between Poles and Soviets).
November . Attempted stabilization under finance minister Michalski.
1922 *June* . Upper Silesia annexed to Poland. Michalski resigns.
1923 *January* . Conference of former finance ministers.
August . Sejm passes law creating capital levy.
October . British financial expert E. Hilton Young invited to report on Polish finances while loan negotiations taking place in London. Compulsory wage indexation law introduced.
December . Grabski cabinet empowered. Wage indexation law passed.
1924 *January* . Reconstruction(monetary reform) law passed. Domestic indexed loans floated. Subscription of new bank of issue opens.
March . Italian loan floated.
April . New bank of issue starts operations.

1925 *March* . Loan floated in the US under Dillon, Reed & co.
June . Tariff war with Germany. Short-term credits obtained from the Federal Reserve Bank of New York.
July . Zloty allowed to float.
November . Grabski resigns and is replaced by Zdziechowski..
December . First visit of American financial expert Edwin Walter Kemmerer.
1926 *May* . Pilsudski coup.
June . Kemmerer's second visit.
1927 *October* . Stabilization loan floated.

Chart 1-3
Polish inflation: 1921-1924
(monthly rates)



SOURCE and OBSERVATIONS: Figures are for cost of living in Warsaw from Republic of Poland(1924) p. 89 up to June of 1922; from then on prices are wholesale from J. P. Young(1924) vol. II p. 349.

1.3.4) Germany

1920 *January* . Versailles Treaty ratified by Allies.
March . Fiscal reforms and attempted stabilization under Erzberger. Kapp putsch defeated.
1921 *May* . London Ultimatum fixes reparation obligation.
August . Former finance minister Erzberger assassinated.
1922 *April* . Genoa Conference. Raymond Poincaré new French chancellor.
May . German government asks a moratorium for reparations payments.
June . Foreign minister Walter Rathenau assassinated. Plans of foreign loan under J. P. Morgan failed.
August . Reparations payments suspended.
November . Keynes/Cassel report on German finances.
1923 *January* . French and Belgian troops invade the Ruhr.
March/April . Reichsbank intervention keeps exchanges stable. First gold loan issued.
August . Hilferding Finance Minister. Second gold loan issued.
October . Luther Finance Minister. Third gold loan issued. Government proposes gold wage system. Attempted tax indexation. Civil service personnel reduction decree.
November . Rentenmark introduced, exchanges and prices stabilized. Schacht appointed president of Reichsbank. Committee of experts appointed (Dawes Committee) by the Allies to report on Germany's "capacity to pay" reparations. Hitler's Beer Hall Putsch defeated.

December . Reichsbank refuses accommodation for Treasury bills. Emergency fiscal ordinances.

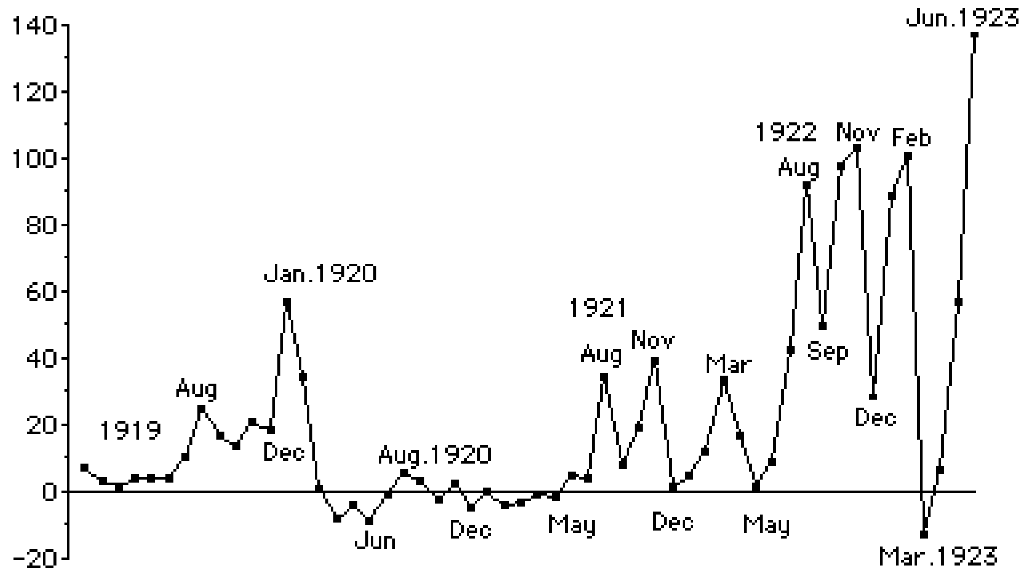
1924 *January* . Schacht visits Montagu Norman and Gerhard Vissering and gets support for Goldiskontbank. First meeting of Dawes Committee.

April . Credit rationing enforced. Golddiskontbank founded. Dawes Committee presents scheme for rescheduling of reparations and foreign loan.

June . Dawes report officially approved.

October . Dawes loan floated.

Chart 1-4
German inflation: 1919-1923
(monthly rates)



SOURCE and OBSERVATIONS: Figures are for wholesale prices from J. P. Young(1924) vol. I p. 530.

Table 1-1
Germany: Inflation rates in the "explosion" phase ,1923
(monthly rates)

month	CPI	Wholesale prices
April-June†	44	67
June	100	132
July	395	221
August	1,459	1,208
September	2,460	2,035
October	24,280	24,432
November	17,865	8,600

† monthly averages for the quarter. Source: C. L. Holtfrerich (1986) pp. 24-33.

Part 1: The “fundamentals” of inflation