

Chapter 6

Indexation, dollarization and stabilization

6.1) Introduction

The more recent visions of the problem of stopping inflation retrieved from the old notion that the problem was "technically simple", involving basically stopping the printing presses, but very often policy makers lacked the courage or the political support to undertake it. Today it is usually acknowledged that stabilization involves a problem of "fundamentals" and another related to the fact that, as argued by R. Dornbush¹, "the question of how stabilization was achieved is not exactly the same as that of why hyperinflation occurred in the first place". The latter refers to what has been called "inertia", or inflationary "memory", namely the strong connection between current and lagged inflation. The nature of this link is rather complex, involving an often unclear mix of institutional factors, uninformed expectations, and strategic interaction. Yet, these issues seemed not to be present in the ends of the hyperinflations, and the reason is very simple: with the advance of indexation and its further degeneration into a process of dollarization there resulted that all economic decisions were engineered having the exchange rate as the unit of account. This would turn the "inertia" problem very simple: to wipe the "memory" of inflation would take simply to fix the exchange rate, which of course would be a lasting solution only if "fundamentals" were also addressed.

This chapter is meant to serve as an introduction to the next four chapters focusing on specific features of each stabilization. It offers in the next section an historical account of the development of wage indexation that draws extensively from a thorough investigation conducted by the International Labor Office addressed mostly to the methods employed by workers in adjusting wages to the rapidly rising cost of living². Some detail is provided on the political and institutional difficulties involved in the adoption of the so-called sliding scales, and how eventually dollarization appeared as a natural solution for living under

¹ R. Dornbush (1985, p. 12).

² The study's main object was Germany, but sub-studies were also provided for Austria, Poland, Hungary and the Soviet Union. ILO (1925), F. Sitzler (1924), C. Forchheimer (1924), J. Szturm de Sztrem (1924) and D. Pap (1924).

very high inflation. Section 6.3 considers accounts of the dissemination of dollarization and also offers some statistical indications in this direction. The last section explores at length the implications of dollarization for the dynamics of inflation in the context of the model of the last chapter and discusses the mechanism of stabilization in a dollarized economy. Section 6.4 also offers many indications of specific solutions reached in each of the stabilizations, which are studied in great detail in the next four chapters.

6.2) The adoption of indexation

All countries experiencing hyperinflations in the early twenties had never been exposed even to moderate inflations; indeed the comparatively small inflations they had experienced during the war had been considered as exceptional and transitory as the war itself. Economic institutions in these countries were thus forced to undergo very drastic and very quick changes in order to allow agents to develop the necessary defenses against inflation. Especially significant among these were the reduction in length and then virtual disappearance of nominal contracts and obligations and the spread of indexation, more and more with respect to foreign currencies, to virtually all classes of economic transactions. The following sub-sections outline the dissemination of indexation in the hyperinflation countries.

6.2.1) Austria

The efforts to implement automatic systems of nominal wage readjustments in response to inflation was one of the crucial items in the agenda of the first cabinets of the new Austrian Republic. In view of the unprecedented frequency of labor disputes and high inflation rates in Austria during 1919, a proposal for the adoption of sliding wage scales based on some hitherto nonexistent official price index was introduced and discussed within a Commission of

Industrial Enquiry in the Autumn³. The Commission could reach no agreement on the methodology for the calculation of the official price index, but it was generally agreed that indexation should be only partial. Chancellor Karl Renner had proposed to the Commission that wages should be divided into two parts, one corresponding to subsistence requirements that should be fully indexed and the other, which should represent the difference in the standard of living between several classes of workers, should remain constant, i. e. unindexed⁴. Most suggestions estimated that the indexed portion should be around 70% in the case of which new contracts would grant bi-monthly wage readjustments corresponding only to 70% of the actual inflation⁵.

Unions did not object to partial indexation for it left a substantial portion of wages to be settled in free negotiation. According to a historian "this desire to avoid a freezing of the miserable wartime wages, and possible gain something from the inflation, also explains why the trade unions hesitated to accept an absolutely mechanical system which would automatically raise and reduce wages in accordance with the purchasing power of money"⁶.

The actual practice included these principles and was complemented by schemes of rent control and food subsidies which formed an important compensation for such underindexing. Some larger unions, such as the metal workers' union and the Federation of Salaried Employees, have started computing their own price indexes to be used in their collective contracts. Some other unions settled very simple rules, such as for example, the brewery workers which in their agreements adopted the rise in the prices of flour, sugar, fat and beer as indexes, much like payments in kind in agriculture⁷.

Only in the beginning of 1921, however, an official price index started to

³ As an effort of political compromise engineered by Prime Minister Karl Renner. Cf. C. Maier(1978) p. 51 and C. A. Gulick (1948) vol. I p. 151-52.

⁴ C. Forchheimer (1924) p. 31 and ILO (1925) p. 100.

⁵ It is interesting to observe that at this juncture there was a legitimate concern from workers to establish a rigid mechanism that would safeguard wages from inflation but that would imply losses in real wages if prices started to fall. This reveals the extent to which even at this point the inflation was regarded as abnormal. Cf. C. Forchheimer(1924) p. 32, ILO(1925) p. 100, E. Marz (1948) p. 513ff, C. A. Gulick (1948) vol. I p. 152.

⁶ C. A. Gulick (1948) vol. I p. 152.

be computed, but it did not command a wide acceptance as the principles based on which the index was computed were little understood and aroused distrust⁸. Later in 1921, as the Austrian inflation reached hyperinflation dimensions⁹ and food subsidies were entirely abandoned, the method of partial indexation was also abandoned. It was agreed that wages should fully reflect the increase in the cost of living and, as a compensation for the loss of food subsidies, a system of family allowances was introduced¹⁰. A Joint Decontrol Commission was formed in December of 1921, with equal numbers of employers and employees, and started to publish a new price index based on methods previously employed by some of the larger unions, which immediately enjoyed wide acceptance. Shortly after, all the larger unions signed collective contracts with sliding scales clauses based on the new index, and the smaller unions and the state official quickly followed. In the spring of 1922 the system of sliding scales had become a general rule for collective contracts in most industries¹¹.

It is difficult to establish the actual coverage of the sliding scales contracts without data on specific union membership. The metal workers union is recognized as the most important and the most active union, the "strategists of the entire Austrian trade union movement", according to Edward Marz, and most other unions followed them in their agreements¹². This obviously reflected the relative importance of the several sectors of the Austrian economy. In 1920 the engineering and metal industries employed around 190.000 workers or 21.4% of the workforce in industry, commerce and transportation¹³. In 1925 around 10% of a total industrial population of 1.200.000 workers was of clerical workers, which formed the core of the Federation of Salaried Employees membership, and only

⁷ C. Forchheimer(1924) p. 35.

⁸ The index was computed out of a variable, and workers deemed it arbitrary, list of items assembled as to make the selection of commodities conforms with the principle that an adult male needs 3000 calories per day. Cf. C. Forchheimer(1924) p. 35, ILO(1925) p. 98 and E. Marz(1948) p.513.

⁹ According to P. Cagan's criteria of a 50% monthly inflation rate , the Austrian hyperinflation started in October of 1921. Cf. P. Cagan(1956) p. 26.

¹⁰ C. Forchheimer(1924) p. 38 and ILO (1925) p. 105.

¹¹ C. Forchheimer(1924) p. 40 and ILO (1925) p. 101.

¹² E. Marz(1948) p. 510.

¹³ W.T. Layton & C. Rist (1925) p. 50

11% of this total was not bound by some collective agreement¹⁴.

In the latter part of 1922, with the attainment of the currency stabilization, a concern grew out of the need for an appropriate consideration of the "conditions of the industry" in granting wage readjustments. With the stabilization unemployment grew to alarming figures, from a total of 57.000 in October of 1922 to 167.000 in February of 1923, which allowed for some deceleration in the sharp recovery of real wages observed since June. But starting in March of 1923 the Joint Commission index again started to show some significant inflation rates¹⁵ and this considerably strengthened the workers reliance on sliding scales which thus had their existence considerably extended after the stabilization. Only in November of 1923 the metal workers would sign a collective contract without sliding scales clauses, on which they were followed by the chemical industry in December. Salaried employees, however, retained indexation provisions in case of resumption of inflation. The textiles industry, for example, signed a contract in January of 1924 establishing automatic adjustments if monthly inflation rates were more than 5%, and the building industries in December of 1923 signed a similar contract though considering a 4% monthly inflation limit. Other unions, such as bank clerks for example, retained full sliding scales as late as in January of 1924¹⁶.

6.2.2) Hungary

The introduction of wage indexation in Hungary was much more "informal", the main reasons being the agricultural character of the country. Hungary had 55.8% of its population in 1920 in agriculture in contrast to 37% in Austria, and 30.1% of its population in industry, commerce and transportation and 4.7% in liberal professions and public offices, while Austria had 46.5% and

¹⁴ *Ibid.* p. 51.

¹⁵ Monthly inflation rates, according to the Joint Commission index, were of 1% and 2% in January and February, but in the next three months reached 6%, 7% and 5%. Cf. C. Forchheimer(1924) p. 41.

¹⁶ C. Forchheimer(1924) pp. 42-44. The textiles industry, together with clothing and shoemaking employed 16.7% , and the building industry 15.9% of the total workforce in industry, commerce and transportation in Austria of 1920. Cf. W. T. Layton & C. Rist (1925) p. 50.

16.5% respectively¹⁷. There is little statistical information on agricultural wages but the available accounts emphasize the absolute predominance of wages in kind, which are said to have provided a very effective shelter from inflation¹⁸. The backwards Hungarian agriculture still accommodated a substantial contingent of farm servants under a variety of share-cropping arrangements, i. e. basically earning their income in kind¹⁹. But even for casual labourers in agricultural the legislation was especially favorable in this respect for it offered the option to the worker to have at least a substantial part of his wage paid in kind²⁰.

As long as industry was concerned one distinguishing feature of Hungarian labor relations was the scanty development of mechanisms of collective negotiation directly associated to the strong right-wing regime following the communist experiment and the resulting violence and persecution on existing unions. Most large scale industries, in contrast to smaller handicraft sectors, systematically refused to engage into collective negotiations, though in many cases a system of informal consultations was established and amounted to a *de facto* bargaining²¹. No official price index was compiled and where indexed contracts were signed one or a combination of the three available private price indexes was used. The government did not take any interest in providing for an index and neither sponsored any initiatives to establish a modern system of labor relations with collective agreements and arbitration courts. In the beginning of 1922 not even a proposal for a joint industrial entity could not be worked out as "the political conditions for collaboration between employers and workers on an equal footing did not exist"²². This represented a marked contrast with European tendencies in industrial relations, a contrast that would ultimately be reflected on

¹⁷ Austrian figures are for 1922 from E. Marz (1948) p. 272 and Hungarian figures from Republic of Hungary (1922) p.16.

¹⁸ D. Pap(1924) p.166. An interesting example along this lines is provided by Soviet Russia where government officials emphasized that inflation in their country differed from the others in that it was an instrument to expropriate the capitalists while elsewhere it served to enrich them. It followed that the government systematically attempted to protect real wages mostly by payments in kind. It is recorded that in 1919 64% of all wage payments were made in kind , and this share increased to 84% in 1920 and to 93% in the first quarter of 1921. Cf. L.Yeager(1981) p. 73.

¹⁹ I. T. Berend & G. Ránki (1974b) pp. 154-155.

²⁰ D. Pap (1923) pp. 649-653.

²¹ D. Pap (1924) p.166.

the standard of living of the working classes throughout the 1920s.

Again in 1923, with inflation in full swing, unions pressured the government to establish compulsory sliding-scales and arbitration courts, to which the government reacted by obtaining emergency powers to issue orders on labor disputes. But in any event, despite the strong resistance to introduce formal mechanisms of indexation "owing to the greater clearness of ideas on the subject and also to the tenacious struggles of the workers, considerable progress has been made in taking the rise in prices into account in fixing wages", and in 1923 indexed contracts were "again introduced, and today [February of 1925] it is already fairly widespread, though not so much in large scale industry as in handicraft"²³.

6.2.3) Poland

The introduction of sliding scales clauses in collective contracts in Poland had a decisive impulse in May of 1920 when the government appointed a joint commission to investigate the "Increases of the Cost of Living for Families of Workers Engaged in Industry and Commerce". This commission was attached to the Central Statistical Office and was composed of equal numbers of representatives from the unions, employers and government. Their function was to produce an official cost of living index based on prices collected in several municipalities and with allowance for the marked regional differences in prices among the several parts of the country. The lack of such index introduced considerable difficulties in the negotiations of collective contracts, which were very disseminated in Poland, even in agriculture.

The earliest application of sliding scales clauses was in a contract for the wood industry in June of 1920, which was followed by contracts for the tobacco, metal-working and chemical industries, chemists' shops and municipal telephone services still in 1920²⁴. Out of 165 collective contracts registered in 1920 and

²² *Ibid.* p. 158.

²³ *Ibid.* p. 161.

²⁴ J. Szturm de Sztrem (1924) p. 400. In 1937 the wood, metal-working and chemical industries employed around 278 thousand workers out of a total industrial labor force estimated at 730

1921, 45 included sliding scales clauses, and these referred mostly to the largest industrial sectors where unions were more active and represented a substantial part of the industrial labor force²⁵. The index of the joint commission was generally considered very reliable, which rendered it very popular²⁶, and as inflation persisted and accelerated after June of 1922 the use of sliding scales quickly became general, with resistances being found only in small undertakings, offices, domestic servants and also for government officials²⁷. The latter, which included some half a million workers, constituted a case of very late adoption of sliding scales, which they managed to include only in their contract of February of 1923²⁸.

Collective contracts had been made compulsory in agriculture, where 60% of the labor force effectively worked²⁹. Part of the wage was traditionally paid in kind and contracts usually indexed the part in cash to the average price of some agricultural produce³⁰. In 1922 a large collective contract concluded for the first time for a group of seven central and western provinces established that wages were to be fixed in rye and reckoned in marks every quarter according to the average market prices of rye observed³¹.

The collective contracts employed in Poland at this time usually established monthly adjustments on the basis of the observed inflation in the previous month, which worked smoothly during 1921 and part of 1922. But this method tended to produce significant losses if inflation was accelerating so that, as hyperinflation started a number of "compensations" were introduced. A common expedient was a special *ad-hoc* bonus paid every time there was a substantial difference between the rates of inflation for the current and previous month. In the autumn of 1923, for example, state officials demanded a bonus equivalent to two months of salary, and the government had to concede most of

thousand. Cf. J. Taylor(1953) p. 84.

²⁵ J. Szturm de Sztrem (1922) pp. 1-2.

²⁶ ILO (1925) p. 123.

²⁷ *Ibid.* p. 124 and J. Szturm de Sztrem (1924) p. 400.

²⁸ *Ibid. idem.*

²⁹ Z. Landau & J. Tomaszewski (1985) p. 56.

³⁰ ILO (1925) p. 124 ff.

³¹ Republic of Poland (1928) p. 45.

it³². In other cases the adjustment was made quicker, or on the basis of the inflation rates of the last week of the previous month, and in some others wages fixed in gold started to be adopted. But in general these methods could not avoid a substantial fall in real wages during the period of higher inflation³³.

Late in the inflation process the government passed a law making compulsory the introduction of sliding scales in all collective contracts, at least until the real wages of the workers in question did not reach the levels of June of 1914³⁴. Meanwhile, wages established in zloty or gold and paid in marks at current rates of exchange were increasingly used as the currency as stabilized. At this point sliding scale in industry were firmly established and continued to be employed at least until the spring of 1924. Thereafter, the increased unemployment and the fact that wages recovered their pre-war levels, thus making workers loose the support of the law, led to their gradual abandonment³⁵. In agriculture, however, the system of reckoning wages in rye and paying them in currency according to the average market prices persisted untouched at least until 1928³⁶.

6.2.4) Germany

The development of wage indexation in Germany took place within a well established and widely accepted system of collective agreements covering an estimated 14 million workers, or 84% of the total labor force in agriculture, industry and commerce³⁷. Collective contracts adapted to the inflationary environment in two principal ways: first, the wage provisions started to be drawn independently of the rest of the contract, considerably speeding the process of collective bargaining³⁸; and second, the period covered by these wage clauses was progressively curtailed. Before the war contracts and its respective wage

³² ILO (1925) p. 124.

³³ Ibid. p. 115 and Z. Landau (1968) p. 199.

³⁴ ILO (1925) p. 126.

³⁵ Ibid. p. 127.

³⁶ Republic of Poland (1928) pp. 45, 58

³⁷ ILO (1925) pp. 44-45. C. Bresciani-Turroni(1929) argues further that this represented 75% of the total working population.

³⁸ ILO (1925) p. 46 and F. Sitzler (1924) p. 646.

provisions usually lasted one year. In the beginning of 1921 this was reduced to an average of six months and by the end of the year it was reduced further to an average from one to three months; late in 1922 recontracting of wage provisions was seldom concluded for more than a week or a fortnight³⁹. In the very latest stages of the process, there are accounts of wages being recontracted and paid every day; collective bargaining was then described as "continuous"⁴⁰.

The spread of indexation was hampered, at least initially, by the fact that there was no reliable official cost of living index at the onset of the hyperinflation, as also observed in the other countries. This turned out to be a very problematic institutional development: an official cost of living indexes was only introduced as late as February of 1920 in Germany. Before this, labor negotiations were conducted with the help of a multiplicity of private indexes computed by federations, specific industries, unions and local authorities, and very often the discussion on the methodology for the construction of the index was confused with the very issues of wage bargaining under discussion. The official indexes were revised and improved in a number of ways before they gained wide acceptance in sliding scales agreements⁴¹. Along the way underindexing was often present and in view of this workers were compensated with a number of ad-hoc measures such as schemes for rent control, direct food subsidies and cost of living bonuses and family allowances⁴².

The introduction of wage indexation in agriculture proved much easier than in industry. Sliding scales for agricultural wages were "widely adopted at least in those cases where the money wage was secondary to the wage in kind"⁴³. The choice of index or basket of goods to which to index to was also much simpler for agricultural workers. In Pomerania and other agricultural districts, for example, the price of rye, often combined with that of potatoes, was generally used for indexing wage payments⁴⁴. This was actually equivalent to the payment

³⁹ Ibid. and also G. Bry (1960) p. 224.

⁴⁰ G. Bry (1960) p. 225.

⁴¹ F. Sitzler (1924).

⁴² ILO(1925) pp. 48-53, 95-96 and 121.

⁴³ F. Sitzler (1924) p. 650.

⁴⁴ Ibid. p. 650 ff.

in kind that was already in use in these districts.

In any event, the flexibility thus displayed by the mechanism of free negotiation in Germany rendered unnecessary the introduction of government sponsored sliding-scales, as in Austria and Poland in analogous circumstances⁴⁵. The German Ministry of Labor made every effort to improve and speed the dynamics of free collective negotiations and often expressed its disapproval of what it deemed as a "purely mechanical adaptation of wages". The Ministry of Labor's justifications for the dislike of sliding-scales - in addition to the fact that "such a system leaves no scope for making the necessary allowances for the special conditions of each branch of industry and for the general economic situation" and that it would be inflationary⁴⁶ - relied on the interesting point that "wages at a given moment cannot be accepted a priori as correct, either in absolute value or in relation to one another, and should not be perpetuated by an automatic system of adaptation"⁴⁷. But in mid 1923 the inflation rate became so high that it became no longer practicable to draw nominal contracts for however short a period of time. The Ministry of Labor then proposed the introduction of the so called "gold wage" system; shortly thereafter a wide agreement between employers and workers established an improved version of the government's proposal, a system of gold indexed contracts for a period ranging from 4 to 8 weeks⁴⁸. As reported by an observer, "gold wages were introduced comparatively quickly and smoothly as the value of the mark became stabilized. The change began in the large towns, which were the first to have fairly large quantities of stable currencies at their disposal, and in December 1923 it spread over to the whole country"⁴⁹.

⁴⁵ See J. Sztrurm de Sztrem (1924) and C. Forchheimer (1924).

⁴⁶ On which a report of the Ministry of Finance of September 1922 laid special emphasis. Cf. F. Sitzler (1924) p. 649.

⁴⁷ Ibid. idem (our emphasis).

⁴⁸ The government's proposal took the form of a publication called "P determining factor for setting prices". Cf. F. Ringer (1969) p. 80 and G. Stolper, *The German Economy*, p.152. Many such accounts can be found in W. Guttman & P. Meehan (1975).

⁴⁹ F. Sitzler(1924) p. 659. It should also be mentioned that the acceleration of inflation gave birth to a number of practices that "substituted" for indexation such as payments in installments in advance, wages partly in kind and personal privileges such as access to food, clothing and coal at the job. Cf. G.Bry (1960) pp. 224-225.

6.3) Dollarization and Monetary Innovation

In his insightful paper on the German inflation Gerald Merkin observed that inflation manifests itself to individual agents as "a rise in costs" - higher raw materials/wages cost for firms and a higher cost of living for workers - to which agents respond by "raising one's own price". Merkin further observed that such readjustment of prices should be made according to "replacement costs", and not to "historical costs", and that "there comes a time in a period of rapid inflation when it is no longer possible to use the price index with any precision for this purpose, and therefore the calculation of the replacement price is made by reference to the current exchange rate to the dollar"⁵⁰. It is interesting in this respect to quote at some length contemporary expert account of the pricing rules observed during the hyperinflation in Austria:

[in such inflationary environment] the cost price is no longer a trustworthy basis for the calculation of selling prices. In order to determine the price at which the goods must be sold so as not to incur a loss at the new price level, it is not the cost price but the actual costs of reproduction of the finished article which have to be calculated As regards a considerable part of the costs a basis existed in the rates of foreign exchange, for the wholesale prices of imported raw materials and coal moved up and down in unison with the rates of exchange. It should be borne in mind that Austrian industries have to import most of their raw materials and coal from abroad. The next step was therefore to estimate the cost of reproduction in some stable currency and to add a certain margin of profit. In Austria this process was called *valorisieren*, and the Swiss franc was generally used for the purpose. By converting the resulting figures into Austrian crowns at the rate of the exchange of the day, it was easy to say what selling price ought to be asked. Often this conversion was not even carried out: wholesale business, for instance, was transacted directly in Swiss francs Once the retail dealers had perceived that the wholesale prices of the articles in which they dealt rose in the same proportion as the rates of foreign exchange they also began to "valorize" their prices. In many shops the articles were marked with basic prices in dollars or Swiss francs, which were daily converted into crowns at the current rate of exchange, and thus the retail prices also began gradually to follow the rise of the foreign exchanges. The foreign exchange rates were the only fixed standard in the shifting chaos of values, and all prices adapted themselves to its measure the connection between the individual prices had become so firm by 1922 that not only the wholesale prices of imported goods but also the other wholesale prices, retail prices and wages rose in the same proportion as the rates of foreign exchange⁵¹.

⁵⁰ *Ibid.* p. 43 . See also G. Bry (1960) p. 224 and ILO (1925) p. 74.

⁵¹ Emphasis in the original. Cf. J. van Walré de Bordes(1924)pp.176-178. The author, a Dutch economist and financial expert, was a member of the League's Commissioner-General's four members staff for the Austrian scheme.

In Germany, according to Schacht, "sliding, in lieu of fixed, prices for commodities became the rule before the year 1922 was out. They were arrived at either by the addition of some "supplements" calculated on the basis of the exchange quotations of foreign currencies, or by multiplication by some coefficient based on index numbers, or by any other method calculated to ensue something like stability of value ... Where prices were still quoted in marks, they were revised at ever shorter intervals"⁵². Bresciani-Turroni reports that "in the summer of 1922 the most important industries, one after another, adopted the practice of expressing prices in a foreign "appreciated" money (dollars, Swiss francs, Dutch florins, etc.) or in gold marks"⁵³. In Poland, especially after the introduction of the zloty in the summer of 1923, the practice of expressing prices in dollars became general; according to a contemporary, the Polish mark was "virtually abandoned as a monetary standard; all calculations were effected in stable currencies. Prices followed rigorously the depreciation of the mark in the exchange market or even surpassed it in view of the habit developed during the inflation of fixing them including a premium so as to insure against the sudden depreciation of the currency"⁵⁴.

The advance of dollarization can be otherwise attested by a different methodology. Table 6-1 shows correlations between inflation and lagged inflation and exchange depreciation during the hyperinflations:

⁵² H. Schacht (1927) p. 66.

⁵³ C. Bresciani-Turroni (1937) p. 342. According to Angell in 1923 "the depreciation became so rapid that prices in many shops were adjusted to the exchange rates every hour or two, and eventually were fixed outright in foreign currencies". Cf. J. Angell (1932) p. 22. "All the stores, according to an observer, close at noon until the new exchange rate is published". Cf. Karl-Heinz Abshagen reproduced in H. C. Meyer (1973) p.129. Eventually, "the dollar ...became the yardstick of values and the determining factor for setting prices". Cf. F. Ringer(1969) p. 80 and G. Stolper (1940) p.152. Many such accounts can be found in W. Guttman & P. Meehan(1975).

⁵⁴ P. Robin (1932) p. 17. See also M. A. Heilperin (1931) p. 94, Z. Landau(1983) p. 515, L. Czarnozyl (1930) p. 71 and G. Zdziechowski (1925) p. 4. For similar accounts for Hungary see

Table 6-1
Correlations Between Inflation, Lagged Inflation and Exchange Depreciation¹

	Austria		Hungary		Germany		Poland	
	\hat{D}_{t-1}	\hat{e}_{t-1}	\hat{D}_{t-1}	\hat{e}_{t-1}	\hat{D}_{t-1}	\hat{e}_{t-1}	\hat{D}_{t-1}	\hat{e}_{t-1}
First Half ³	0.51	0.73	0.46	0.55	0.18	0.74	0.30	0.14
Second Half	0.54	0.93	-0.16	0.92	0.36	0.98	0.44	0.93
Whole Period ²	0.57	0.83	0.39	0.69	0.37	0.98	0.55	0.85

SOURCES and OBSERVATIONS: (1) Sources of price data are the same of Table 5-1, and for exchange rates Table 4-2. (2) periods considered were January 1921 to August 1923 for Germany, February 1921 to November of 1922 for Austria, May 1921 to April 1924 for Poland and January of 1921 to June of 1924 for Hungary. (3) Included 16 observations for Germany, 11 for Austria, 15 for Poland and 22 for Hungary.

The idea underlying Table 6-1 is that the advance of dollarization would lead to an increasing correlation between current inflation and the lagged value of the exchange rates depreciation⁵⁵. This can be seen by computing and comparing correlations for the "early" hyperinflation period - the first half - vis-à-vis the "late" period, or the second half. Table 6-1 considered periods considerably longer, whenever possible, than Cagan's hyperinflation period as delimited by his definition of hyperinflation. The correlations between inflation and exchange depreciation were already high during the first half of the period, except for Poland, which would be consistent to the fact that some indexation with respect to exchange rates or gold units of account (pre-war gold marks or gold crowns) was already being implemented. For the second half all correlations between inflation and depreciation reached very high values, which is fully compatible with the evidence of widespread indexation with respect to the exchange rates. It is interesting to observe that the correlations between current and lagged inflation were not especially high during the first period, much in the contrary for Germany, and increased only slightly on the second half, even declining up to a

M. Mitzakis (1925) pp. 112,120,164 and 173.

⁵⁵ For Poland and Germany we used exchange rates that were monthly averages so that the depreciation thus calculated would be like a "half-lagged" value with respect to depreciation as computed with observations of end of the month exchange rates ; in these cases the correlations computed in Table 2-2 are referred to "current" exchange rate depreciation .

negative correlation in Hungary. This is due to the fact that exchange rates were generally used for indexing purposes, as opposed to lagged observations of the price indexes.

6.4) The making of stabilizations: an outline

The problem of inflation stabilization, as usually presented, comprises a problem of "fundamentals" and another related to the fact that, as argued by R. Dornbush⁵⁶, "the question of how stabilization was achieved is not exactly the same as that of why hyperinflation occurred in the first place". Ordinarily, in order to remove the link between current and lagged inflation - which is likely to be very strong in low or intermediary inflations - the public faces a problem of collective decision making that involves a complex "intra-public" game similar to the one involved in the provision of a public good - price stability in this case - and that involves strong incentives to free-riders. The problem of wiping out this "inflationary memory" are being recurrently emphasized in the debates around the stabilizations of high inflations of our days⁵⁷ and different attempts to provide solutions are embodied in some of the "heterodox" packages applied in Brazil, Israel, Argentina and Mexico.

The inertia problem, however, was hardly an issue in the cases of the hyperinflations of the 1920s (and also for the recent Bolivian case!) basically because the "coordination" problem was sidelined by the phenomenon of dollarization. Since every price in the economy was quoted in dollars, and transactions were made using the exchange rates of the day (of the hour !), pegging the exchange rate was all that was necessary to stop inflation overnight. This was actually the reason why the hyperinflations ended so abruptly⁵⁸.

It is easy to see this in the framework of Chapter 5's model, in which inflation is determined by inflationary inertia and by "fundamentals" which

⁵⁶ R. Dornbush (1985, p. 12).

⁵⁷ On the absolute need of coordination devices ("incomes policies" in their terminology) to fight high inflations see R. Dornbush & M. H. Simonsen (1987).

⁵⁸ This fundamental point has escaped the attention of most writers on the subject; significant

correspond to the inconsistency between ψ_e and ψ_w . This is easily seen by rewriting the internal balance - or the dynamics of inflation - relation:

$$\begin{aligned} \Pi_t = & \lambda \{ (1-\gamma) \Pi_{t-1} + \gamma \hat{e}_{t-1} \} + \alpha_1 \Omega \{ (e/p)_t - \psi_w \} + \\ & + \theta' \xi \{ \psi_e - (e/p)_t \} - \sigma(u_t) \end{aligned} \quad (1)$$

Note that even if it is possible to wipe out inertia - the first term in the equation - this would not be sufficient in itself as a stabilization strategy, once it provides no a solution for the fundamental problem of the incompatibility between ψ_e and ψ_w . In this connection "artificial" stabilizations obtained by price freezes, economy wide agreements, or temporary fixing of the exchange rate are likely to collapse if ψ_e and ψ_w are not reconciled; similarly the solution for the distributive tension in itself would not do away with the system's inflationary memory.

The process of dollarization would bring two important implications to the dynamics of inflation as described by equation (1) that would play a very important role in solving the inertia problem. The first is to consider that as contract length had become very small, the lagged effect of the exchange depreciation on prices due to wages indexed to gold, or other forms of indexation, becomes nearly indistinguishable from the current effect especially if one is working with monthly data. This allows us to rewrite the wage indexation relation as⁵⁹:

$$\hat{w}_t = \lambda \{ \gamma \Pi_{t-1} + (1-\gamma) \hat{e}_t \} + \Omega \{ \psi_w - (w/p)_t \} - \sigma(u_t) \quad (2)$$

The second important effect of the advance of dollarization is that $\gamma \rightarrow 0$, which means that the term on \hat{e}_{t-1} or inflationary inertia progressively disappears. Yet dollarization in itself does not imply a reduction in inflation for the system remains in an equilibrium very close to the one under no dollarization⁶⁰. In the

exceptions are G. Merkin (1982), F. L. Lopes (1986) and G. H. B. Franco (1987).

⁵⁹ Under this assumption the PP relation would be slightly different, and its slope would now includes \bar{e} and \bar{a} explicitly so that the stability conditions would now be related with the degrees of indexation and dollarization. Again stability implies that the slope of PP to be greater than the slope of BP, which is more likely to be violated when the degree of indexation increases. Yet it is significant that the model becomes unstable for some $\bar{e} < 1$, for we do not actually need the PP curve to be flat but only to be steeper than BP.

⁶⁰ Comparing the implied expressions for the PP relation under $\bar{a} = 0$ and $\bar{a} = 1$ it can be shown that

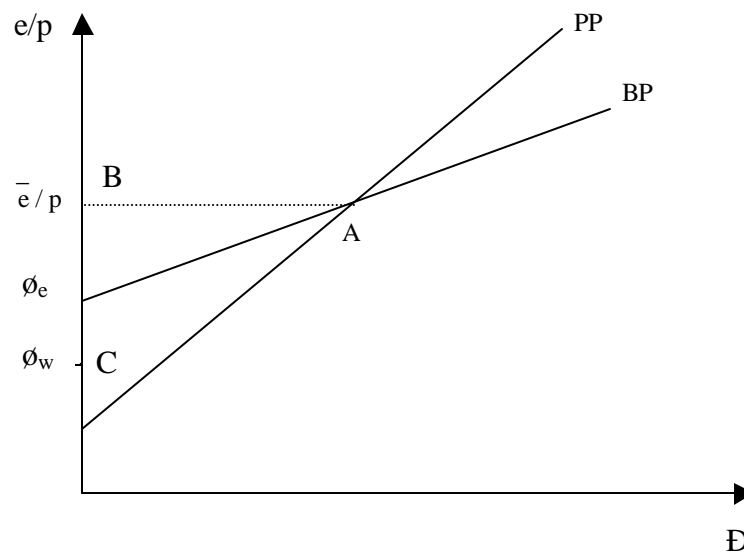
equilibrium the level of inflation is precisely the factor that is enlarging the external imbalance to a point that wages have to be considerably reduced to assure external balance; the current account is thus adjusting to effect the "transfer" of the capital flights. The reaction of workers to the pressure to reduce wages, meaning partial indexation and a wage push term, is precisely what maintain inflation so the cycle is closed. Along the way, the original impulse, namely $\psi_e - \psi_w$, might have become small as compared to the levels of inflation. The distinctive characteristic of a dollarized economy is that inflation can be written very simply as:

$$\Pi_t = [1 - \theta(1 - \lambda)] \cdot \hat{\epsilon}_t + \theta \cdot \Omega \cdot \{\bar{w} - (w/p)_t\} - \sigma(u_t) \quad (3)$$

Since $\hat{\epsilon}_t$ is mostly determined by inflation itself, equation (3) describes a vicious circle whose "height" may have gotten entirely out of proportion with the original impulse $\theta \cdot \Omega \cdot \{\bar{w} - (w/p)_t\}$. Inflation is then overwhelmingly determined by exchange depreciation, as it is indeed observed in the regressions of the last chapter, so that the obvious and natural way to cut the inflationary process back to the size of the real wage gap in one stroke in a dollarized economy is to fix the exchange rate⁶¹. All four hyperinflations were terminated this way, and following the stabilization in most cases a moderate wage driven inflation ensued until the wage gap, which had reached very large values at the peaks of the hyperinflations, was closed as shown in great detail in chapters 8, 9 and 10. The mechanisms involved in such stabilizations can be seen with the help of Graph 6-1.

the intercept is increased (or the PP shifts upwards) and the slope is decreased (or the curve rotates outwards) so that the final result as far as equilibrium inflation is concerned is ambiguous. In fact inflation would be slightly higher as the economy dollarizes if the level of inflation is high.

⁶¹ For economies that are not dollarized and not very open fixing the exchange rate might be quite ineffective to terminate inflation, as it is clearly demonstrated by repeated experiences in Latin America and especially in Argentina.



Graph 6-1: Pegging exchange rates under full dollarization

Consider a dollarized economy, at least in the sense that equation (3) holds, that is in an equilibrium at point A in Graph 6.1. As the central bank fixes the exchange rate at the current market rate, or at \bar{e} , inflation is brought immediately to zero at point B, for stopping exchange depreciation is immediately transmitted to prices by the dollarization mechanism. At this point, however, the real exchange rate is greater than $\bar{\psi}_e$, or the economy is on a surplus region accumulating reserves. That happens because without inflation capital outflows or "flights" from the currency should cease. The issue at this point is obviously how reliable is the stabilization so that most likely confidence (or the lack thereof) might be such that the BP curve might be very flat at this point. At B, on the other hand, wages are much lower than the target level so that a wage push quickly ensues. The inflation thus generated gradually erodes the real exchange rate bringing the economy from the surplus to the deficit region, i. e. crossing the BP curve, until point C is reached. At C point the wage pressure ceases because real wages have reached the target but since the basic incompatibility between ψ_w and ψ_e is not solved at point C the economy is experiencing a payments deficit which is basically financed by running out of reserves. It is clear though that

under fixed exchange rates the economy tends to settle at ψ_w , or where the wage target is met. If $\psi_e > \psi_w$ this would be a deficit region and at some point in the future the peg might have to be suspended.

Dear money can help to reduce the gap, and thus the outflow of reserves for it could bring the two curves closer together. In fact, experience shows that for "moderate" imbalances dear money can be maintained for prolonged periods of time; Britain after 1925 provides a benchmark example in this respect. But for the four countries considered with it is fair to say that the inconsistency between ψ_w and ψ_e could not be solved unless temporarily or marginally by dear money⁶². The crucial part of the process is the reconciliation between ψ_w and ψ_e or a solution for the "fundamentals" of the problem. In fact the only possible long run equilibrium under fixed exchange rates would obtain when $\psi_w = \psi_e$, i. e. without wage push inflation and without pressure over reserves, where external balance obtains at the target wage.

The stock of international reserves plays a very important role in the process for even under a significant inconsistency between ψ_w and ψ_e a large stock of reserves could "buy time" which in practice might result very important for the end of the hyperinflations. Normally the economy will take some time, or successive strokes of the wage push, to go from B to C in Graph 61, and once there the stock of reserves would determine how long the peg can be sustained. By sustaining the peg for a long time the government might achieve many things. Tax revenues, for instance, recover dramatically and the economy approaches budgetary balance. This and the success of the government intervention in the foreign exchange market might build up "confidence", which might be translated into autonomous capital inflows (a decrease in R). In addition to that a prolonged period of price stability would dissolve indexation arrangements, which might become very important if for some reason the government is forced to abandon

⁶² After all, if contractionary policies are able to produce significant shifts in both schedules, then we are assuming that inflation is low enough to be affected by purgative recessions, and this is not appropriate for high inflations.

the peg and let the currency float.

The choice of parity is also important as far as "buying time" is concerned. By choosing to stabilize at the market rate, as assumed in Graph 6-1, the government gain the time required for the economy to cross the BP curve and enter the deficit region and also the time it takes to reach ψ_w . If the government is not interested in experiencing that inflationary spell it could stabilize, for instance, at ψ_w . The path from B to C is abbreviated but from the very beginning the economy is in the deficit region so that relatively to stabilizing at the market rate the ψ_w alternative requires more reserves to sustain the peg for the same period of time. It might very well be that there are no reserves enough to secure a choice like ψ_w . Thus by choosing a high (a more depreciated) parity the policy authority will commit less reserves at first but will inevitably face inflationary pressures originating on the wage push sometime later. This is a fair description of the Polish case, as we will see in detail in Chapter 9. By choosing ψ_w initially the policy authority could avoid this inflationary episode by determining a large one-shot appreciation of the currency; this is very much what happened in Germany, as we will see in Chapter 10. In this case a substantially larger amount of reserves and/or contractionary policies might be required.

Regardless of the stock of international reserves the fundamental condition for the stabilization was the reconciliation of ψ_w and ψ_e . All four countries experienced a major improvement in their international position either during the inflation period (by gains of territory or by forced "revisions" in wage targets induced by an authoritarian government, for example) or after the stabilization (for example, by regained access to international capital markets or by a major rescheduling of external debts). The second half of the 1920s was a period of abundance in terms of foreign capital so that to a great extent these countries imbalances, or the difference between ψ_e and ψ_w , could be solved by autonomous capital inflows (a reduction in R enough to equate ψ_e and ψ_w). In

each case, however, this solution would acquire specific character.

For Austria and Hungary, for instance, the stabilization implied, as predicted in our model, a sharp increase in real wages towards pre-war levels⁶³, as it will be seen in detail in Chapter 8. The respective budgets would be very quickly balanced, as we will see in the next chapter, mostly by the autonomous recovery of the revenues. Large external loans were floated for both countries, and such loans by themselves were large enough to sustain the peg in both cases for a very considerable period of time. But apart from the loans themselves a steady inflow of long term capital was reestablished, Vienna regained her role as trading center connecting Eastern and Western Europe, an array of commercial treaties was promoted under the League's auspices and markedly contractionary policies, fiscal and monetary, were also implemented. For Hungary more specifically, the recovery of wages was only moderate and the average unemployment rates for the few years following the stabilization was much higher than elsewhere. This could be so as the authoritarian government that ruled the country throughout the 1920s destroyed union organization and forced a downwards "revision" of the wage demands.

In Germany the stabilization would also bring wages back to their pre-war levels very quickly as the government opted for a parity rate much below (or more appreciated) than market rates. On the fiscal side, tax revenues would recover so strongly as to balance the budget in less than 40 days render superfluous any significant effort of austerity as regards expenditure. The "fundamental" solution for the inconsistency between ψ_e and ψ_w would come only sometime later with the rescheduling of reparations payments determined by the Dawes loan and the flood of foreign loans that followed. In the meantime Germany maintained the peg on the exchanges thanks to the by mostly by virtue of the rentenmark experiment. The introduction of the rentenmark was like a "fiduciary" increase in international reserves: being "stable-valued" the new currency satisfied in part the demand for dollars that was created by fixing the exchange rate. It was basically

⁶³ This was somewhat deterred in Hungary by the authoritarian government policies as regards labor unions, as examined in Chapter 2.

like a large external loan providing reserves for the intervention effort. The question of why the rentenmark was accepted as a stable value currency is certainly the key to the German solution to the hyperinflation problem and it will be seen in great detail in Chapter 10.

The Polish stabilization followed a somewhat more complex sequence. First the government was forced to fix a parity that was somewhat above market values, so that it did not take much reserves to sustain. The Poles did not count very much on external loans, and neither did they attempted any monetary innovation such as the rentenmark, so that they did not have much alternative other than to stabilize at the market rate. The hyperinflation was successfully stopped, but after the stabilization real wages increased very fast and the initial accumulation of reserves weakened and then turned into a precipitous fall. The currency was then allowed to float but only well over one year of price stability. At this point the country's balance had been "fundamentally" improved by the annexation of Upper Silesia and by the investment projects undertaken after 1921; in addition to that indexation arrangements had been mostly dropped. At this point the Polish managed to stabilize again but at this time with contractionary policies and major changes in commercial policy. This time the Poles could go to international capital markets after having stopped the hyperinflation without external help and obtain a large stabilization loan in good conditions and with low conditionality.

6.4) Summary

This chapter provided evidence on the dissemination of indexation arrangements in labor contracts and on the advance of dollarization in the hyperinflation countries. It was then argued that dollarization modified very substantially the nature of the stabilization problem these countries faced. The "inertia" problem was then sidelined there remaining the issue of sustaining the exchange rate fixed while "fundamentals" were solved. The model developed in the last chapter was used to illustrate the mechanism of stabilization and several

indications were provided on the specific features of each stabilization. The essential point to retain was that the end of the hyperinflations involved many elements: the coordination device provided by dollarization, and the resolution of issues related to "fundamentals": a substantial improvement in the external position - which might be the revision of the reparations schedule, a territorial change (as the annexation of the coal exporting Upper Silesia region to Poland) or the reopening of international capital markets - and certainly budget balance. None of these was sufficient by itself; the stabilizations succeeded only when these pieces fit together, as it will be seen in great detail in chapters 8, 9 and 10.