TEXTO PARA DISCUSSÃO

Nº 159

The Rentenmark "Miracle"

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May 1987

[1]Earlier versions of this paper have benefited from comments from Barry Eichengreen, Jeffrey Sachs, Lance Taylor, Susan Vitka, Francisco L. Lopes, Marcelo de Paiva Abreu, and from the members of the Economic History Workshop at Harvard.

1. Introduction

The German inflation was hailed by Lionel Robbins as "the most colossal thing of its kind in history"[2]; and at least as judged by the incredibly vast amount of research devoted to the episode, the very same applies to *the end* of the German inflation. The German stabilization is often referred to as a "miracle"[3], which is somewhat indicative that the episode has not yet been fully understood, especially as far as the nature and workings of the monetary experiment represented by the *rentenmark* is concerned. Indeed, no adequate explanation has ever been offered for the German public to accept the *rentenmark* as a "stable-valued" currency in November of 1923. Traditionally this alleged "miracle" is associated to a limit imposed on the total *rentenmark* issue which would force the government to live "within its own means"; this would characterize what has been called a "regime change"[4]. It is not often observed, however, that such limit was not binding as the *rentenmark* had a fixed exchange rate with the ordinary Reichsbank notes that were neither demonetized nor subject to any limit by the reform. An explanation for this old enigma is therefore very clearly lacking.

This paper will attempt to provide this explanation, along with some indispensable elements for a comprehensive explanation for the German stabilization. The basis for this explanation is to be found in the extraordinary advancement of indexation, its further degeneration into a process of "dollarization", and on the monetary innovations generated by the inflationary explosion. These developments are reviewed in the next two sections; in which we also offer a detailed account of the experience with the "stable-valued" monies. With the stage thus set, section 4 discusses more specifically the mechanism that made the *rentenmark* a "stable" currency, and also the process by which its introduction permitted the pegging of the exchange rate. The next section discusses more broadly the role the *rentenmark* played for the German stabilization and the existing views on the issue.

2. Indexation and "dollarization"

All hyperinflations of the twenties took place in countries that 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

[2] C. Bresciani-Turroni "The Economics of inflation: a study of currency depreciation in post-war Germany", (London, 1937), p. 5.
[3] The term has been used by many authors, for example G. Stolper, "The German Economy, 1870-1940. Issues and Trends" (New York, 1940) p. 164 and C. Bresciani-Turroni, The Economics of Inflation, p. 336.
[4] Especially T. Sargent "The Ends of Four Big Inflations" in R. Hall (ed.) "Inflation, its Causes and Effects" (Chicago, 1982), p. 83 and K. L. Holtfrerich "Germany and Other European Countries in the 1920s" in J. Williamson (ed.) "Inflation and Indexation: Argentina. Brazil and Israel" (Washington, 1985) p. 134.

countries were thus forced to undergo very drastic and very quick changes in order to allow agents to develop the necessary defences 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 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 labour force in agriculture, industry and commerce[5]. 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 bargaining[6]; and second, the period covered by these wage clauses was progressively curtailed. Before the war contracts and its respective wage 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 1t 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 fortnight[7]. 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"[8].

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 inflation. This turned out to be a very problematic institutional development: an official cost of living index was introduced as late as February of 1920 in Germany. Before this, labor negotiations were conducted on the basis 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 agreements[9], and in view of this workers were compensated for often faulty adaptation of wages to the cost of living, thanks to some bitter labor disputes, with a number of *ad-hoc* measures such as schemes for rent control, direct food subsidies, cost of living bonuses and family allowances[10].

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[5] International Labor Office "Workers' Standard of Living in Countries with Depreciated Currency" (Geneva, 1925), pp. 44-45 and C. Bresciani-Turroni "The Movement of Wages in Germany During the Depreciation of the Mark and the Stabilization", "Journal of the Royal Statistical Society", 92 (1929), p. 375. Collective agreements together with unionization advanced remarkably during and immediately after the war. In 1914, around 2.5 million workers were unionized, while in 1920 this total had increased to 9.1 million. Collective contracts covered only 1.4 million workers in 1914. This increased to 6.0 million in 1920 and further to 13.1 million in 1924, cf. G. Bry, "Wages in Germany, 1871-1945" (Princeton, 1960), pp. 32 and 42.

[6] International Labor Office, Workers' Standard of Living, p. 46 and F. Sitzler, "The Adaptation of Wages to the Depreciation of the Currency in Germany", "International Labor Review" 9 (1924), p. 646.

[7] *Idem ibid*. and also G. Bry, Wages in Germany, p. 224.

[8] G. Bry, Wages in Germany, p. 225.

[9] F. Sitzler, The Adaptation of Wages, *passim*.

[10] International Labor Office, Workers' Standard of Living, pp. 48-53, 95-96 and 121.

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"[11]. 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 payments[12]. This was actually equivalent to the payment 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 circumstances[13]. 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 Labour'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 inflationary[14] – 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"[15]. 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 fully indexed contracts for a period ranging from 4 to 8 weeks[16]. 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"[17].

In essence, the gold wage system adopted the widely disseminated procedure of reckoning real

[11] F. Sitzler, The Adaptation of Wages, p. 650.
[12] *Ibid*, p. 650 ff.
[13] See J. Sztrurm de Sztrem, "Wage Problems in Poland During and After the War", "International Labor Review", 10 (1924) and C. Forchheimer "Sliding Wage Scales in Austria", "International Labor Review", 10 (1924).
[14] On which a report of the Ministry of Finance of September 1922 laid special emphasis, F. Sitzler, The Adaptation of Wages, p. 649.
[15] *Idem*, *ibid*. (our emphasis).
[16] The government's proposal took the form of a publication called "Proposals by the Federal Ministry of Labour as to Possible Methods to Stabilizing the Purchasing Power of Earned Income". The consensus system was published under the title of "Proposals of the Central Industrial Organizations for the Regulation of Wages", both reproduced in F. Sitzler, The Adaptation of Wages, and in International Labor Office, Workers' Standard of Living.
[17] F. Sitzler, The Adaptation of Wages, 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 instalments in advance, wages partly in kind and personal privileges such as access to food, clothing and coal at the job. G. Bry, Wages in Germany, pp. 224-225.

values in terms of an index. One obvious consequence of this was that the national money loses to some very significant extent its unit of account function, though payments continued to be made in depreciated marks; according to a contemporary report on wage indexation, this characterized the "dissociation of the two functions of money, as a standard of value and as a medium of exchange"[18]. But, apart from that, it is important to ask what index was used for these purposes. Many different prices were employed, but most commonly the exchange rate was chosen in view of its daily availability, its correspondence to pre-war units (the gold mark) and its relevance for an economy as open as Germany[19]. This process has been term "dollarization", and its development in Germany, which has had a very learned description in the work of Gerald Merkin[20], is very similar to the ones observed In other high Inflation episodes[21]. Yet, it reached extremes not found elsewhere, and that would give the German experience some very interesting features, such as, for example, the monetary innovations described in the next section.

3. The "stable valued" monies

The "dissociation" alluded above between the unit of account and the means of payments functions of money was the key to the monetary innovations introduced during the hyperinflations. An "imaginary" currency, like the "gold mark", worked like a "money of account" for it was "money" only to the extent that it performed the unit of account function. But, of course, notes could be issued

[18] International Labor Office, Workers' Standard of Living p. 74.

[19] 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", H. Schacht, "The Stabilization of the Mark" (New York, 1927), p. 66. 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", C. Bresciani-Turroni, The Economics of Inflation, 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", J. Angell, "The Recovery of Germany" (New Haven, 1932), p. 22. "All the stores, according to an observer, close at noon until the new exchange rate is published", Karl-Heinz Abshagen, reproduced in H. C. Meyer (ed.) "The Long Generation: Germany from Empire to Ruin, 1913-1945" (New York, 1973), p. 129. Eventually, "the dollar... became the yardstick of values and the determining factor for setting prices", F. Ringer, "The German Inflation of 1925" (New York, 1969) p. 80 and G. Stolper, The German Economy, p. 152. Many such accounts can be found in W. Guttman/P. Meehan, "The Great Inflation" (New York, 1975).

[20] Gerald Merkin, "Towards a Theory of the German Inflation: some preliminary observations" in G. D. Feldman et al. (eds.) "The German Inflation Reconsidered: a preliminary balance" (Berlin, 1982). Another interesting analysis is provided in F. L. Lopes "O Choque Heterodoxo" (Rio de Janeiro, 1986), ch. 18.

[21] For other hyperinflations evidence could be found in J. van Walrés de Bordes "The Austrian Crown, its Depreciation and Stabilization" (London, 1924), esp. pp. 176-178; P. Robin "Le Réforme Monétaire en Pologne" (Paris,1932), p. 17; M. A. Heilperin "Le Problème Monétaire D'Aprés Guerre et sa Solution en Pologne, en Austriche et en Tchécoslovaquie" (Paris, 1931), p. 94; Z. Landau "Inflation in Poland After World War I" in N. Schmukler/E. Marcus (eds.) "Inflation Through the Ages: economic. social, psychological and historical aspects" (New York, 1983), p. 515; M. Mitzakis "Le Relèvement Financier de 1a Honorie et la Société des Nations" (Paris, 1925), pp. 164-173. For more recent episodes, evidence could be found, for example, in F. Pazos "Chronic Inflation in Latin America" (New York. 1972); S. Fischer "Seigniorage and the Case for a National Money", Journal of Political Economy, 90 (1982).

corresponding to "gold marks", and in this circumstance the problem becomes one of securing *value* for these notes.

Since the latter would be essentially "promises to pay" they could be backed 100%, or up to an acceptable cover ratio, by gold. But nothing necessarily implies that these "promises" or "debts" should be redeemable in gold; 1t Is the very principle of fiduciary currencies that the truly important aspect of these "debts" is that they should be repaid in purchasing power over goods and services independently of the "convertibility" aspect, or of the means of payment with which the "debt" is "repaid". That means basically that an *indexed* debt is as good as a debt repayable using the good whose price is taken as the index. That implies, for instance, that, if the real exchange rate is constant, indexed bonds should have constant gold (dollar) prices; if these bonds, for some reason assume monetary properties, such as to serve as means of payment, these indexed *monies* should have a constant exchange rate with gold (dollar). This is the basic principle on which the German "material values" loans were based, as shown in what follows.

Several types of private and semi-official issues of several types of money could be observed during the German hyperinflation. In 1922 a private rye *rentes* bank (*Roggenrentebank*) was founded; it issued its first bill of exchange denominated in pounds of rye in December of 1922[22]. In the beginning of 1923 several public bodies – cities, States and public Utilities' companies – started to issue loans denominated in commodities such as rye, coal, and others as shown in Table 1, but priced and serviced in marks according to the current commodity prices.

These "loan" notes were made in small denominations so as to circulate as means of payment which was actually their main purpose. The Oldenburg issue in Table 1, for example, would be of bonds priced in marks at the equivalent to 125 kg of rye and redeemable in four years at the marks equivalent of 150 kg of rye, which meant a non-compounded rate of interest of 5% a year payable at redemption[23]. Along the same line the company supplying the province of Baden with electricity issued its "coal value loan" in bonds equivalent to 1/2, 1, 2, 5 and 10 tons of coal serviced and redeemed in marks according to the average price of coal observed in the 6 months preceding the payment[24]. Similar issues followed: several other "commodity" loans were issued by the most various of bodies and a variety of other commodities – e.g., wheat, potash, lignite, sugar, beer and even kilowatts – were used for backing, or what was in fact *indexing*, "stable value" loans[25].

[22] H. Schacht, The Stabilization of the Mark, p. 78. See Table 1. In July, 1922 the government had passed legislation authorizing and regulating the issue of these privately issued monies known as "emergency monies" or *netgold*, Republic of Germany-Kriegslastenkommission "Germany's Economy, Currency and Finance" (Berlin, 1924), p. 67.
[23] K. Helfferich, "Money" (New York, 1927), p. 509.
[24] *Ibid*, p. 510.
[25] H. Schacht, The Stabilization of the Mark, p.78; J. M. Robert "Dépréciation de la Monnaie et Équilibre Budgétaire: étude sur les finances allemandes 1922-1923" (Paris. 1926), p. 101 and R. R. Kuczynski "The Elimination of the Paper Mark as Standard of Value", "Quarterly Journal of Economics" 37(1923), p. 764.

Table 1

Material Values Loans, 1922-1923 (as quoted in the Frankfurt Gazzette at August 12th 1923)

Number	Issuing body	Commodity	Total dollar	Subscription date[c]
1	Roggenrentebank	rye		
	series I		400,000	December 30th,1922
	series II		400,000	February 5th
	series III[a]		400,000	April 25th
	series lll[b]		130,000	May 5th
	series IV		114,000	June 7th
2	Oldenburg State Bank	rye	220,000	June 1st
3	State of Macklemburg	rye		
	series I		50,000	December 31st,1922
	series II		70,000	May 24th
4	Prussian State	Rye		
	series I		230,000	May 18th
	series II		244,000	May 25th
5	State of Anhalt	rye	40,000	April 23rd
6	City of Berlin	rye	53,000	June 16th
7	City of Dresden	rye	32,000	July 18th
8	City of Gottingen	rye	10,000	July 1st
9	City of Bernburg	rye	4,900	March 23th
10	State of Saxony	rye	500,000	June 28th
11	District of Sandershaausen	rye	70,000	March 31st
12	Thuringian Evangelical Church	rye	30,000	March 31st
13	Anhalt Evangelical Church	rye	18,000	March 26th
14	City of Hannover	wheat	30,000	June 18th
15	City of Aschorsleben	wheat	12,000	April 23th
16	Badenwerk	coal		
	series I		650,000	February l0th
	series II		650,000	March 10th
17	Grosskrafwerk Mannhein	coal	420,000	February 13th
18	State of Westphal	coal		
	series I		490,000	May 12th
	series II		490,000	June 23rd
19	City of Breslau	coal	240,000	April 20th
20	City of Zwickau	coal	100,000	March 5th
21	State of Saxony	lignite		
	series I		500,000	February l0th
	series II		500,000	March 10th
22	State of Hessen	lignite	65,000	April 15th
23	Badenbürgishe Kreis Elektric.	lignite	120,000	March 17th
24	Mitteldeútschland-Cassel Elektric.	lignite	350,000	February
25	Stadtischenlicht Wasserwerke	coke		
	series I		n.a.	February 15th
	series II		n.a.	February 28th
26	City of Goppingeen	coke	n.a.	n.a.
27	Prussian State	potash		
	series I		230,000	May 14th
	series II		520,000	May 25th
	series III		520,000	June 12th
28	Rheniland-Main-Donau	gold	500,000	April 18th
29	Neckar	gold	250,000	May
30	Suddeútsche Fesvertband Stüttgart	gold	365,000	July 7th
31	Schleswig-Holsteinische Elektrizit.	gold	66,500	n.a.
32	Bayer Grosskraftwerke	gold	n.a.	June 20th
33	State of Hamburg	sterling	4,326,500[a]	August
34	City of Lübek	Swedish Crown	530,312[b]	October
	Total		14,741,212	

Source and Observations: (a) Converted in dollars at the rate of 4.3265 to the pound. (b) Converted at the rate of 3.7744 swedish crowns to the dollar. (c)1923 unless otherwise stated. Compiled from data from J. M. Robert (1926), pp. 94-104.

The value of these bonds remained stable for no other reason than the fact that holding these notes was equivalent to holding commodities with stable dollar prices often quoted in international markets. But the important fact was that these notes were *not* convertible in the commodities; the latter served only to provide a price index to which the notes were pegged, the payments were made in depreciated marks at the current quotation of the commodity. In fact, these loans represented a very interesting class of indexed bond: being reserves of value and means of payments these loans circulated unrestrictedly as money, but with the important feature of being "stable-valued". The experiment, according to Schacht, "spontaneously evolved by the natural course of events"; these loans "enjoyed great popularity, [w]ere unaffected by the fluctuations in the prices of commodities concerned, and the practice of expressing the values in terms of commodities had a long vogue"[26].

The government was attentive to these developments and saw in them an opportunity to solve some of its problems relating to the passive resistance at the Ruhr, and the support of the exchange rate initiated in March[27]. In an attempt to stem the outflow of reserves, the government decided to issue a *dollar* denominated "stable valued" loan, i.e., a dollar indexed bond, with the purpose of securing foreign exchange for the continued support of the mark[28]. This gold loan represented an advance over the "material value loans" as it would be indexed to the dollar; indexation to the dollar was chosen so that it would be reserve of value and means of payment like the others, but would employ a much less confusing and already widely used unit of account. These notes appeared to have all characteristics of money in addition to being "stable valued" or *Wertbeständiges*. But the government issued the loan in large denominations which rendered it unsuitable for means-of-payments functions. The loan was actually considered a failure[29] for it did not provide a sizable increase in international reserves: only one half of the total issue of 50 million dollars was subscribed immediately and the stock of reserves at this point stood around 240 million dollars. Yet the notgeld law authorized banks to Issue their own *Wertbeständiges* currencies against deposit of such bonds, so that to the extent that the subscribing banks did make issues the loan would have fulfilled its functions.

In August, the government decided to repeat the experience, but this time the purpose was not to obtain foreign currency to support the mark but was very dose to the idea of monetary reform[30].

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[26] H. Schacht, The Stabilization of the Mark, p.78.

[27] Parallel to the strategy of passive resistance, the German government had decided to employ the hither to untouched Reichsbank reserve to stabilize the exchanges. The move appeared to be an attempt to further wear down the French initiative and possibly win over the British, who had been insisting on the Reichsbank using its reserve to check the depreciation for quite some time. C. Maier "Recasting Bourgeois Europe, Stabilization in France, Germany and Italy in the Decade After World War I" (Princeton, 1975), p. 366.

[28] See Republic of Germany, Germany's Economy, p. 72.

[29] According to Havenstein quoted by C. Maier, Recasting Bourgeois Europe, p. 367.

[30] The loan was issued on August 14th; and by this time Helfferich's plan of monetary reform, which would later be put into operation, had already been offered to Cuno's attention, J. G. Williamson "Karl Helfferich, 1872-1924 Economist, Financier, Politician" (Princeton, 1971), pp. 386-387 and K. Helfferich "Germany's Currency and Finance (series I to

The new "loan" had denominations as low as 1/10, 1/4, 1/2, 1, 2 and 5 dollars, in addition to the ordinary large denominations. The total Issue was of approximately 120 million dollars, an amount nearly as large as the gold value of the outstanding Reichsbank notes at this point[31]. Around 72 million of the total issue corresponded to subscriptions of small denominations[32]. Shortly thereafter the Railway system issued a "stable-value" loan of approximately 40 million dollars guaranteed by a deposit of the gold loans or of a Gold Treasury Bond especially created to serve as backing for *wertbeständiges* currencies[33].

It is interesting to observe the composition of the money supply, broadly understood as the collection of all monetary assets with means of payment properties, shown in Table 2. Private *wertbeständiges* experienced a tremendous "boom" after the official issues but there is little information on the amounts in circulation by the end of 1923. We considered in Table 2 the total value of 14.7 million dollars reported in Table 1 and an *ad-hoc* estimate of 30 million dollars for December. The amounts reported for gold loans and the railway issue show a sharp increase as a substantial part of the subscriptions – actually their final instalments – were made during this period. The amount of foreign currencies in circulation reported in the table is an estimate based on the following: German historian C. L. Holtfrerich estimated it as between 476.4 million and 714.6 million dollars and Bresciani-Turroni established somewhat wider bands at 120 million and 950 million dollars[34]. According to the balance of payments figures reported by the League of Nations an amount of approximately 286 million dollars of foreign banknotes was "exported" during 1924 and 1925[35]. This certainly accounted for a substantial portion of the stock of foreign currencies hoarded or in circulation in Germany by the end of 1923. Most likely a comparable portion of these hoards appeared in the balance of payments statistics as "unaccounted" inflows, which totalled 176.3 million dollars in 1925[36]. For the purpose of Table 2 we opted for a conservative estimate of 450 million dollars. Lastly, Table 2 includes *rentenmarks* as stable-currencies, which will be explained in the next section.

VII), The Statist (1924).

[31] In July, the gold value of the outstanding Reichsbank note issue was 131 million dollars. J. P. Young "European Currency and Finance" (Washington, 1925), vol. I, pp. 537-538.

[32] See Republic of Germany, Germany's Economy, pp. 57 and 72.

[33] *Idem*, p. 68.

[34] C. L. Holtfrerich, Germany and Other European Countries, p. 125; C. Bresciani-Turroni, The Economics of Inflation, p. 345. See also H. Schacht, The Stabilization of the Mark, p. 106 and W. Baumgartner "Le Rentenmark (15 Octobre 1923 – 11 Octobre 1924)" (Paris 1925), p. 95.

[35] League of Nations "Memorandum on International Trade and Balance of Payments 1912-1926", vol. I, Review of World Trade and Balances of Payments (Geneva, 1927), pp. 81-90.

[36] *Idem*, *ibid*.

Table 2

Proximate Composition of the Money Supply:

November/December of 1923 (millions of dollars)

	November 15th	December 15th
Private wertbeständiges	14.7[1]	30.0[2]
Gold loan notes[3]	65.6	113.0
Railway stable valued notes	2.4	33.8
Foreign currencies[2]	440.0	440.0
Rentenmarks[2]	-	199.4
Stable currencies total	522.7	816.6
Regular currency[3,4]	41.2	125.8
Total	563.9	942.4

Sources and Observations: (1) From Table 1. (2) Estimates, see text. (3) From Republic of Germany, Germany's Economy, p. 20. (4) Includes Reichsbank notes and legal non-stable notgeld.

A remarkable fact documented in Table 2 is the insignificance of the circulation of regular "non-stable") currencies at the onset of the stabilization. If money substitutes were said not to allow the elimination of the paper-mark in 1922[37], by the fall of 1923, after the August gold loan, Schacht argued that "the Reich may be said officially to have abandoned the paper mark"[38]. The dissemination of stable monies, in conjunction with the remarkable increase in the amount of foreign currencies in circulation, resulted in the progressive weakening of the "moneyness" of the national money; the monetary functions of a store of value and unit of account were practically taken over by foreign currencies and at the latest stages of the process even the means of payments function was surrendered[39]. This "fractioning of the monetary space"[40] actually characterized a process of "dollarization" that was extraordinarily advanced by November 15th. it is important to observe that in these conditions the rate of inflation with respect to the paper mark loses all significance for all transactions are indexed or denominated in foreign currencies. indeed, it has been noted that "dollarization" can be seen as "one means of reducing the economically relevant inflation rate"[41]. More specifically as regards the hyperinflations it has been observed that "the relevant inflation rate could be declining well before the stabilization of the inflation rates in terms of the national money. In the final phases of the hyperinflation the national money practically disappeared and all transactions were denominated and effectively realized in foreign currency. At this point, the best measure of the system's effective inflation rate is probably the rate of appreciation of the real

[37] R. R. Kuczynski, The Elimination of the Paper Mark, pp. 768-769.
[38] H. Schacht, The Stabilization of the Mark, p. 77.
[39] An interesting discussion can be found in J. Robinson "Review of The Economics of Inflation by C. Bresciani Turroni", Economic Journal, 48 (1938), p. 512 and J. M. Keynes "The Tract on Monetary Reform" in "The Collected Writings of John Maynard Keynes, Vol. IV" (London, 1971), p. 50.
[40] A. Orléen, "Une Nouvelle Interprétation de L'Hyperinflation Allemande", Revue Économique, 50 (1979) p. 534.
[41] S. Fischer, Seigniorage and the Case for a National Money, p. 296.

exchange rate"[42].

In principle the government could extend the issue of "stable currencies" – and the demands in this respect were very strong – up to levels comparable to the total demand for money under stable prices: after all *dollar prices* were stable. But a very essential point to observe is that such indexed monies would maintain a stable relation with the dollar so long as these monies and the paper mark coexisted in circulation. The provision that these monies appreciated with respect to the paper mark at the same rate with which the paper mark depreciated with respect to the dollar made them stable-valued *by construction* in the paper mark was demonetized this mechanism would be lost and the indexed monies would become ordinary fiduciary currencies. As far as their relationship with the dollar was concerned, they would be then "hanging on its own bootstraps"; their being stable-valued would basically depend on their convertibility features. There would be no basic difference between the no longer indexed currencies and the ordinary paper mark, except for the determinants of their individual supplies. This would be the slippery world of the private competitive monies associated with Hayek. In sum, while the paper mark existed, the indexed monies or the *werbeständiges* would enjoy a stable relation with the dollar, but not necessarily so (most likely not) if the paper mark was withdrawn for circulation. The stage was thus very clearly set for the monetary reform implemented through the introduction of the *rentenmark.*

4. The Rentenmark Mechanism

The incredible dimensions of the price inflation observed after June, 1923 and the perspective of complete economic collapse of the Reich forced the German government to consider what appeared then a seemingly hopeless stabilization attempt without a settlement of the reparations issue[43]. The proposals discussed in the late summer and early fall of 1923 bore no relation with the negotiations that started later on and would lead to the Dawes loan late in 1924; the alternatives discussed then were basically "unaided" ones. There was a number of Ideas under consideration, most of which hinging on the establishment of a new gold backed currency, such as those of socialist theorist Rudolf Hilferding, banker Hjalmar Schacht, the Federation of Industries and State Secretary Julius Hirsch, among others[44]. An obviously decisive handicap to all of them was the very reduced

[42] F. L. Lopes, O Choque Heterodoxo, p. 133, my translation.

[43] In this respect, Helfferich argued in February 1924 that "we had to try the experiment without being able to wait either for an amelioration of the general economic and political conditions or for a solution of the Reparations problem... although such a reconstruction and solution form the condition *sine qua non* for a permanent salvation of our monetary system". He added that "the experiment that has been realized in the Rentenbank is an enterprise of deadly risk; it is a jump over a precipice, the opposite ledge being veiled in clouds". C. Helfferich "The Success and Prospects of the Rentenmark" The American Monthly 17(1924) p. 261.

[44] See C. L. Holtfrerich, Germany and Other European Countries, p. 129, Y. D'Abernon "German Currency: Its Collapse and Recovery, 1920-1926" Journal of the Royal Statistical Society 90(1927), p.24, H. Schacht, The Stabilization of the

stock of *divisen* at the Reichsbank, and the fact that a foreign subscription of a new bank of issue, as much as a domestic one, even if mandatory, were both regarded as unfeasible[45].

One important point to observe as regards Germany was that reserves were never depleted, so that at some points the real value of the money stock fell as low as to reach values for which the cover ratio was very close to 100%. In the late summer/fall of 1922, for example, the Reichsbank reserve stood at 220 million dollars and the real value of the money supply had been reduced to approximately the same value[46]. Similarly in July of 1923 the real value of Reichsbank notes in circulation was estimated to be approximately 130 million dollars while international reserves were worth about 120 million dollars[47]. Yet in both occasions the real value of the money supply was very small compared to the stable prices demand for money; considering the money stock observed during 1925-26, for instance, the cover ratios assured by existing reserves at these moments would be 17.5% and 9.5%[48]. These values would be too small to assure a gold convertibility in normal conditions, or under stable prices; but as observed by many authors, including Keynes and Bresclani-Turroni[49], the government could declare convertibility at a fixed exchange rate, thus stopping the hyperinflation, and sustain it at least for a short period of time. Experience would show, though, that such period of time was indeed very short, for in a couple of months the cover ratio had already fallen to unsustainable levels[50]. Besides, the failure of the exchange rate stabilization attempt enforced simultaneously with passive resistance at the Ruhr had convinced the German authorities that gold reserves were not enough to sustain a continued intervention to support the mark without additional sources of foreign exchange. These arguments, and in particular the notion that a 100% gold convertible currency would allow a total issue regarded as insignificant and unsustainable in view of the probable "needs of trade" following the stabilization[51], were instrumental to defeat Hilferding's proposal of creating a gold department at the Reichsbank[52].

The available alternative was Helffertch's proposal of a new currency indexed, but not convertible, to *rye* that was basically a development or an extension of the experience with the

Mark, p. 82 passim and W. Baumgartner, Le Rentenmark, pp. 16-19.

45 See W. Baumgartner, Le Rentenmark, pp. 16-19.

46 J. P. Young, European Currency, vol. I, p. 537 and Republic of Germany, Germany1s Economy, p. 65. See also C. Maier, Recasting Burgeois, Europe, p. 296.

47 J. P. Young, European Currency, vol. I, p. 538 and Republic of Germany, Germany's Economy, p. 65.

48 Considering the average money supply of 1,260 million dollars.

49 J. M. Keynes, Tract, pp. 46-47 and C. Bresciani-Turroni, The Economics of Inflation, p. 346.

50 It is interesting to observe that if we consider only the ordinary Reichsbank notes and the alleged "paper" issue of *rentermarks* in December, the gold cover ratio, that had been nearly 100% in the end of November, had already been reduced to 28% (ignoring the probable reserve losses of December that are not reported in the Reichsbank returns, though admitted by Schacht, The Stabilization of the Mark, p. 129) in the end of December.

51 The legendary reluctance of German officials, Havenstein in particular, in committing the Reichsbank reserves to stabilization attempts becomes thus understandable. Besides, a strong reserve position represented a strong bargaining instrument in the reparations-stabilization *imbroglio*, so much that Havenstein once referred to using the reserve for less than a definitive stabilization effort as "cutting Samson's hair", as quoted by C. Maier, Recasting Burgeois Europe, p. 297.

52 J. G. Williamson, Karl Helfferich, p. 390.

"material value" loans and the gold loans described in the last section. The idea was that the several "economic units" of Germany, agriculture, industry and commerce, would be obliged to subscribe a new bank of issue but *in paper marks*, and in this respect it differed very fundamentally from the founding of banks of issue in Austria, Hungary and Poland, where the subscription was an attempt to capture gold hoards. The participation of each group of subscribers in the new bank would be proportional to its respective wealth or property and a mortgage on such wealth would serve as a guaranty against the highly unlikely refusal from participation in the new bank, and also against the failure of the new institution. This is nothing more than usual for companies of unlimited responsibility; by no means the new institution was meant to be an incarnation of the German national wealth as it seemed to be the popular view. This might have been a useful notion for public relation purposes, but had no economic basis whatsoever.

This new institutions main task would be to issue a mortgage bond indexed to rye prices (*rentenbriefe*), in the same fashion as the other "material values" *Wertbeständiges* loans and gold loans were issued. A significant difference would be that instead of issuing the bonds in small denominations to circulate as means of payments, the proposal suggested the issuance of notes called *reggenmarks*, in small denominations so as to become means of payment, but also 100% convertible on the rye indexed bonds. The proposed *reggenmark* would therefore be a "stable valued" currency by the same, at this point widely known, mechanism that made the several other "material values" loans "stable valued", examined in detail in the last section[53].

It was ingenious, though certainly not conventional, and the success of the *wertbeständiges* loans together with the unfeasibility of the other alternatives made it very appealing. So much that in the early days of August the Cuno government, and especially its finance minister Luther, was quite willing to implement the plan[54]. The Cabinet fell, however, and the Minister of Finance of the Stresemann's cabinet, Rudolf Hilferding, was frankly hostile to the idea[55]. Hans Luther, now minister of food, brought the plan to Stresemann's attention, and the project slowly gained ground; even before Hilferding was replaced by Luther the plan had been accepted. The only significant amendment to the project was that instead of rye as an index for the *rentenbriefes*, gold was to be used. After all the

[53] See W. Baumgartner, Le Rentenmark, pp.24-36; H. Schacht, The Stabilization of the Mark, p. 80 and A. Fourgeaud "La Dépréciation et la Revalorisation du Mark Allemand et les Enseignements de L'Expérience Monétaire Allemande" (Paris, 1926), pp. 199-201 passim.

[54] K. Helfferich, The Success and Prospects, and Germany's Currency.

[55] Hilferding considered the plan a "theoretical monstruosity", J. G. Williamson, Karl Helfferich, p. 390. It was a Hilferding's idea that money took its value from the labor required to produce it, so that to have value at all money had to be convertible on some substance having "intrinsic value", such as gold. That this made him a "rather old-fashioned" metallist was observed by H. Ellis "German Monetary Theory, 1905-1933" (Cambridge, 1934), pp. 93-101. It was also observed by Schumpeter and even by Lenin. W. A. Daritydr/B. L. Horn "Rudolf Hilferding: the dominion of capitalism and the dominion of gold" American Economic Review 75(1985) p. 365. It is somewhat Paradoxical that in this debate that socialists endorsed Hilferding's reactionary views on money and the innovative view was authored by a distinguished politician of the right on this paradoxical monetary conservativeness of the left see C. P. Kindleberger "A Financial History of Western Europe" (London, 1984), p. 327.

new currency was not to be convertible in rye but only pegged or indexed to rye prices, so there was no reason not to index it to gold which was superior as a price index[56]. In light of this change the notes backed by the indexed bonds had their name changed to *rentenmarks*, and in October 15t^{h} the especially empowered government Issued the monetary reform decree.

From the beginning, the new currency enjoyed a very high demand. Schacht reported that the public was "anxious" to exchange his paper-marks into *rentenmarks* and that "in the first few days of the *rentenmark* issue long queues, stretching out into the street, were formed where the notes were being issued"[57]. The public seemed to be well aware that the *rentenmark* had a fixed parity to the dollar, which followed from it being a *wertbeständiges* or a "stable valued" currency as many others already in circulation, and enthusiastically accepted it as such. The introduction of the *rentenmark* appeared to the public like the introduction of another gold loan; in this respect it is interesting to note that after the new law was passed there would still be a month delay until the *rentenmarks* would be ready for distribution, and during this period the government did issue another gold loan to bridge the gap and, like for the other gold loans, the public's reaction was very positive[58].

Two important provisions would make the *rentenmark* issue much more than simply the issue of another, though very large, gold loan. First, it seemed implicit that the old paper mark would be demonetized at some uncertain point in the future, but its issuance was not to be interrupted until much later. In this manner the *rentenmark* and the old paper mark would coexist in circulation and there would be nothing to prevent the old mark from depreciating with respect to the *rentenmark* the same way it was depreciating with respect to the dollar and to the other "stable valued" currencies. The introduction of the *rentenmark* by itself would do nothing to the inflation rate measured in the old marks unless the exchange rate between the old mark and the *rentenmark* was fixed; this was actually the second fundamental feature of the *rentenmark* experiment: that rate was fixed at the "convenient rate" of a trillion to one. It should be clear that this was by all means equivalent to fixing the exchange rate between old paper marks and the dollar as illustrated by the diagram[59].

As *rentenmarks* started to be issued on November 15th, the government acted in two fronts: given that the *wertbeständiges* mechanism warranted that one *rentenmark* was exchanged for 10/42 dollars, as shown in the diagram by the continuous arrow, the government simultaneously exchanged *rentermarks* against old paper marks at the rate of a trillion to one; simultaneously it employed its

[56] Schacht observed that indexing with respect to rye "was calculated in a masterly manner to appeal to the psychology of the agricultural community", on whose political support the government depended. H. Schacht, The Stabilization of the Mark, pp. 85-87. It was more than that however. Rye indexing assured that the "contribution" from agriculturalists to the Rentenbank would be indexed to the same prices relevant to the determination of the agrarian's income, thus preventing possibly sweeping windfall gains or losses.

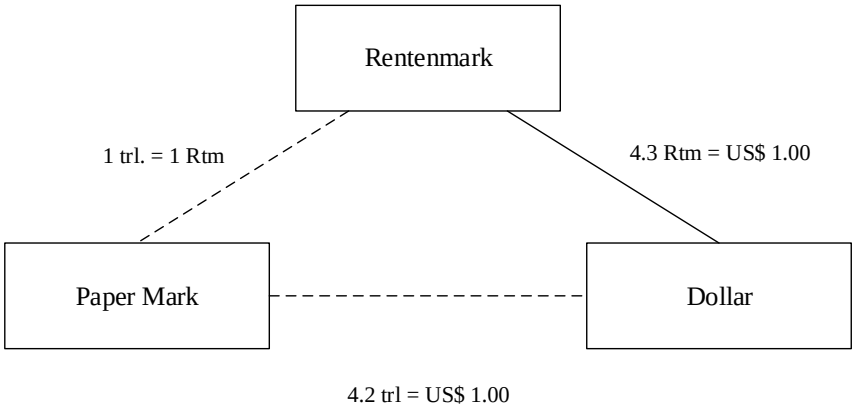
[57] Although most people were eager to get rid of its old marks, even some *divisen* were offered in exchange for the new currency, H. Schacht, The Stabilization of the Mark, p. 99.

[58] Republic of Germany, Germany's Economy, p. 72.

[59] This mechanism is explained by Schacht in a similar fashion, *ibid*. pp. 114-115.

international reserves to intervene in the foreign exchange market and sustain the rate of 42 trillion paper marks to the dollar[60]. As a result of this twofold attack the exchange rate was stabilized; as indexation transmitted it to domestic prices inflation was stopped in one stroke.

Diagram 1: The *rentenmark* mechanism



The stabilization was achieved basically by means of pegging the exchange rate in the context of a "dollarized" economy[61]; the decisive and distinguishing element of the German case was unquestionably the *rentenmark* experiment. The underlying mechanism was actually the development of a very simple principle namely that indexed bonds are "stable-valued" in the sense that for a given real exchange rate such bonds would have constant or at least stable dollar prices independently of the level of inflation[62]. This principle was already known by the public thanks to the dissemination of the "stable valued" *wertbeständiges* currencies and the gold loans, so that the government could go one step ahead and issue notes convertible on the indexed bond with this being understood from the very beginning.

5. The Rentenmark and the Stabilization

Once it is accepted that the *rentenmark* was a stable-valued currency, it follows that the issuance of the new currency can be seen as equivalent to a sale of indexed bonds with means of payments properties or more simply as an external loan. Yet small external loans could very well be insufficient to secure currency stabilization for obvious reasons; similarly, a total issue that was too high could

[60] *Ibid.*, p. 112.
[61] This fundamental point has escaped the attention of most writers on the subject; again the important exceptions are Gerald Merkin, Towards a Theory of the German inflation, p. 46 and Francisco L. Lopes, O Choque Heterodoxo, p. 133.
[62] The actual determination of the price of an indexed bond in inflationary conditions is somewhat more complex. The relevant aspect for our purposes was that the indexed bond was a good substitute for foreign currencies and sometimes even better than these to perform monetary functions.

become problematic. The total authorized issue was limited to 762 million dollars; this amount, if added to the stock of international reserves in November of 1923 would sum 870 million dollars, which would provide a "cover" of stable currencies for approximately 70% of the stable prices demand for money as measured by the 1926-27 average value of 1260 million dollars. The rentenmark "loan" was then very substantial, even when compared to stabilization loans floated by other countries. It was not as big as the Austrian loan floated under the League of Nations auspices, which represented more than 100% of the stable prices demand for money; but it was bigger than the Hungarian one, which represented less than 50 % of the value of the stable prices money demand.

But it should be clear that any stabilization effected with a loan would be no more than temporary if "fundamentals" were not addressed. This is by no means our subject; we need just mention though that there is a lasting controversy on what these "fundamentals" should be. Often the latter are associated with fiscal imbalances that would have been solved simultaneously with the stabilization; for many authors the stabilization would have been *caused* by these "fiscal reforms"[63]. Others attributed the inflationary explosion to payments imbalances, and more recently to the perverse combination of these and the extraordinarily strong pressures from the labour movement to recover pre-war levels of real wages[64]. This paper does not dwell into that; our purpose is merely to assert the importance of the *rentenmark*, we only discuss "fundamentals" insofar as it implies assigning any role to the *rentenmark*. This is very much the case for the "orthodox" explanations (old and new) for the German stabilization. Bresciani-Turroni, for example, argued that there was no reason for the "stable value loans" to have a stable value because their guarantees were "purely fictitious... [b]eing mere paper without any cover". With respect to the gold loans he argued that "the public allowed itself to be hypnotized by the word *wertbeständiges* written on the new paper money"[65]. He argued further that the *rentenmark* was an inconvertible paper currency like the old paper mark only with a different name[66], a point which is basically endorsed by Thomas Sargent; according to Sargent "while great psychological significance has sometimes been assigned to this unit change, it is difficult to attribute any substantial effects to what was in itself only a cosmetic measure"[67]. Other authors, even the non-monetarists, have put forth similar analyses. Angell referred

63 More recently by T. Sargent, The Ends of Four Big Inflations; C. L. Holtfrerich, Germany and Other European Countries; R. Dornbusch "Stopping Hyperinflation: lessons from the German experience of the 1920s" NBER Working Paper nº 1675 (1985); Steven B. Webb "The Four Ends of the Big Inflation in Germany" unpublished, University of Michigan, l985.

64 Notably by K. Laursen and J. Pedersen "The German Inflation 1918-1923" (Amsterdam, 1964) and Gustavo H. B. Franco "Aspects of the Economics of Hyperinflations: theoretical issues and historical studies of four European hyperinflations of the 1920s" UMI, Ann Harbor, 1986.

65 C. Bresciani-Turroni, The Economics of Inflation, p. 344.

66 *Ibid*., p. 348.

67 T. Sargent, The Ends of Four Big Inflations, pp. 82-83. This diagnostic is fully endorsed by German historian C. L. Holtfrerich, Germany and Other European Countries, p. 134.

to the *rentenmark* as a "confidence trick"[68]. For Stolper, it was a "psychological device"[69] and for Graham "nothing more than a new tenor of inconvertible paper"[70]. More recently Karl Hardach argued that the "backing" for the *rentenmark* notes were "fictitious", though it was enough to generate the "desired psychological effect"[71]. Steven B. Webb termed it a "fable"[72]. Rudiger Dornbusch too, in a recent paper, does not offer any explanation for the pub1ic's acceptance of the gold loan as hard currency despite it having "no backing", but concedes that the *rentenmark* was stable-valued because it was convertible 1:1 on the gold loan[73]. Even Gerald Merkin, who suggested that inflation had been stopped with the fixing of the exchange rate through the dollarization mechanism, argued that the *rentenmark* was "psychologically an advantage", the "real act of stabilization [b]eing the intervention of the Reichsbank in the foreign exchange market"[74].

Most observers of the phenomena thus have emphasized the pathological aspect of the *rentenmark* not being convertible to or backed by gold and that its only "real" backing was the mortgaged property of the *Rentenbank*'s subscribers. For these authors the disastrous experiences of the Assigners and of John Law's Banque Royalle notes was a lively reminder that the new system assured no backing at all for the new currency[75]. But it was argued then that even an unbacked "paper" currency could maintain a fixed relation with gold or other currencies if sufficiently limited in quantity. This typical "bullionist" argument was actually what many authors presented as an explanation for the "miracle of the *rentenmark*": the public accepted it at a fixed relation with the dollar because its issue was fixed in quantity. Two observations should be made about this "limited issue" argument. One is that this classic bullionist argument would apply only if the rentenmark was an ordinary "paper" currency like the old mark, which was not the case. The *rentenmark* was accepted by the public at a fixed rate to the dollar because it was convertible into a gold indexed bond and this fact would not be changed if no limits had been placed on its total issue[76]. As explained in the last section the exchange rate was stabilized as the government launched a two-pronged attack on the public's desire for "flight" from the mark by offering *rentenmarks and* foreign exchange at fixed rates

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[68] J. Angell, The Recovery of Germany, p. 24.
[69] *Apud* F. Ringer (ed.), The German Inflation, p. 86.
[70] Frank Graham **"**Exchange, Prices and Production in Hyperinflation: Germany, 1920-23" (New York, 1930), p. 12.
[71] K. Hardach, "The Political Economy of Germany in the Twentieth Century" (Berkeley, 1980) p. 29.
[72] S. B. Webb, The Four Ends of the Big Inflation, p. 18.
[73] R. Dornbusch, Stopping Hyperinflation, pp. 9-10.
[74] G. Merkin, Towards a Theory of the German Inflation, p. 46.
[75] See, for example, C. P. Kindleberger, A Financial History, p. 326; H. Schacht, The Stabilization of the Mark, p. 85; G. P. Young, European Currency, vol. I, p. 426; A. Fourgeaud, La Dépréciation et 1a Revalorisation du Mark, p. 202; V. D'Abernon, German Currency, p. 36 and F. Graham, Exchange, Prices and Production, p. 12ff. 16.
[76] This obviously does not mean that *rentenmark* overissues could not happen. The supply of *rentenbriefes* could be so much enlarged (after all they were "paper" or "fiat" guarantees), and so could the *rentenmark* issue, that a point would be reached where the public would be no longer willing to accept additional quantities of the indexed bond. At this point the *rentenbriefes* would most likely fall to a discount, in case of which they would be *underindexing* the purchasing power used to buy them, so the *rentenmark* would consequently depreciate with respect to the dollar. In this sense there would be a "critical point" beyond which additional issues of indexed bonds would characterize an "overissue" and would result in depreciating the new currency.

to the old paper marks. If the *rentenmark* issue had been limited to some binding number, one of the "arms" of the attack would have been weakened and the responsibility for preventing the "flight" from the currency would have been placed mostly upon the limited Reichsbank reserve. Since the stock of international reserves *alone* was too small for the task, as it was argued against the Hilferding's stabilization proposal, it follows that there would be a *minimum rentenmark* issue which would make the stabilizing intervention feasible at all[77].

The second observation to be made is that, given that the exchange rate between *rentenmarks* and old marks was fixed, any limit on the *rentenmark* issue would be meaningless without a corresponding limit on the issue of old "paper" marks. In fact, there was no limit on the Reichsbank note issue on the basis of discounting private commercial bills, which actually nearly tripled during 1924. No "bullionist", or their modem monetarist successors, would ever concede that excessive money growth could be prevented under these conditions; Ricardo had made it clear long before that the only check to "overissues" in such an "inconvertible paper" world would be the "prudence" or the discretion of the bank of issue. It is very likely that this prudence could be found in Schachf's Reichsbank presidency, but the important point is that excessive monetary growth would not be curbed by some well-defined quantitative limit on money creation, but by something more subjective and elusive, namely Schachf's reputation and the strength of his commitment to a "sound" monetary management. Whether this commitment could be taken for granted in October of 1923 is not merely a matter of Schacht's convictions and the strength of the government: if a settlement for the reparations issue was not to be found monetary management, no matter how "sound", could do little to prevent the collapse of the stabilization.

[77] Considering a stable-prices demand for money of 1,260 million dollars and an acceptable convertibility rate of 40%, a minimum reserve of 500 million dollars would be required to establish a gold standard. Since the stock of international reserves in November of 1923 was about 111 million dollars the necessary, or the minimum *rentenmark* issue would be of approximately 389 million dollars or 1,633 billion *rentenmark*, about half of the authorized issue.