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The Causes of German Hyperinflation 1919-1923

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Abstract

Between 1919 and 1923 Germany experienced a period of inflation which, by November 1923, had left the German mark valueless as a currency, with the result that it had to be replaced by a new unit of currency, the Rentenmark, where one Rentenmark had the value of one trillion old-style marks. This paper explores why this calamitous collapse of the German mark happened. The basic cause is found to be a continuous and increasingly rapid increase in the money supply, which in turn provoked an acceleration in the velocity of circulation of money. This increase in the money supply arose out of the government's persistent budget deficits, which were funded through the Reichsbank purchasing Treasury Bills with printed money. This process was fuelled by the effects of the Treaty of Versailles and the reparation payments imposed on Germany, which not only encouraged the printing of money and the depreciation of the external value of the mark, but led to the Ruhr occupation of January 1923, from which the descent of the mark into utter collapse can be traced. However, to explain how it was that the German banking and financial institutions were willing to act in such a way as to destroy their own currency, emphasis is given to the understanding of the inflationary process prevalent within Germany, according to which the increase in the supply of money was not the cause of the inflation but the effect of the inflation – in which case the responsibility of the monetary authorities was not to limit the supply of money to check prices but to increase the supply of money to match prices. Only when this policy was abandoned in November 1923 did the inflation end.

On 25 October 1923 the German Reichsbank proudly announced that it had printed, that day, using over 2000 printing presses and the output of 30 paper mills, marks to the value 120,000 million million. It was a good achievement – but not good enough, since the estimated demand for cash that day was a quintillion marks (1,000,000,000,000,000,000). Chastened, the Reichsbank promised to do better, hoping to reach a daily production of half a quintillion marks by the week's end.[1] Thus was captured the absurdist world of the German monetary

[1] C. Bresciani-Turroni, *The Economics of Inflation: A Study of Currency Depreciation in Post-War Germany* (London, Allen and Unwin, 1937), p. 82.

system by the last weeks of the hyperinflation: a world where the state Bank was proud to print 120 million million of notes on one day; where even this gargantuan quantity was regarded as too little; and where the Bank promised to run its printing presses still faster – so fast, in fact, that by the end there was only time to print on one side of the paper.

Freshly printed marks ready for distribution

There remained only one thing to do: to terminate the Bank's delirious career. Its activities were suspended; a new currency (the Rentenmark) was introduced on 15 November 1923 and a new bank to oversee its management – the Rentenbank. In place of a note issue of 74 million million million marks a week, there would be a maximum issue of 2,400 million. With these measures the fantastic career of German inflation dissipated like the morning mist. The precipitous collapse of the mark was arrested. Prices stabilised. In October 1924 a new currency, the Reichsmark, was introduced, one Reichsmark having the value of one Rentenmark (= one gold mark) and one trillion (1,000,000,000,000) old-style marks. This sudden ending of the German hyperinflation provides a clue to causes. But a clue only. For if the inflation's end was sudden, swift, and simple, its origins lay in a process that was neither simple nor quick to operate. The German inflation of 1919-23, a process characterised ultimately by price rises so rapid, and the fall in the value of the mark so fast, as to make the unit of currency useless as a store of value, a measure of value, or a means of exchange, began during the war and was an occurrence in which psychology and the theories people formed of reality were quite as important as the state's financial and monetary policy.

The Course of the Inflation

In his 1937 *The Economics of Inflation*, the Italian economist Constantino Bresciani-Turroni traced the stages in the German hyperinflationary process. The below logarithmic diagram depicts the value of an original gold-mark in terms of paper marks (line A) as well as the ratio of German to USA prices (line B). The basic pattern is:

1. A slow process of declining paper value of the mark through the war
2. Rapid loss of value in 1919
3. Relative stability of the mark during 1920 and into second half of 1921
4. Rapid and accelerating fall in the currency from later 1922

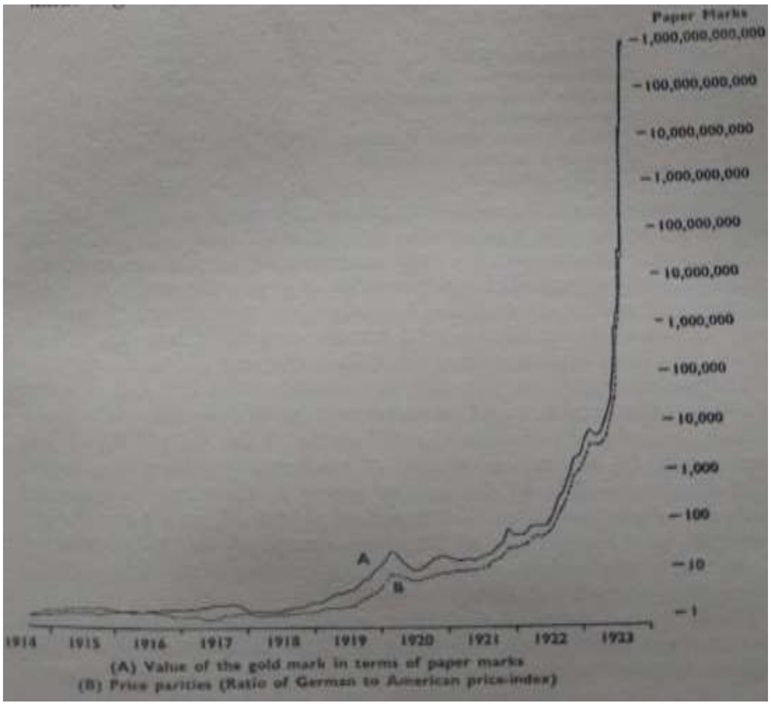


Diagram One. Values of Gold Marks in Terms of Paper Marks 1914-1923[1]

'Never before', writes Frank Graham, 'had a paper money fallen at so rapid a rate over such an extended period. In 1913 the mark was solidly based on gold; in 1923 its value was, as one writer said, something more ridiculous than zero.'[2] The following table recounts the stages of the inflationary process in more detail.

[1] *Ibid*., p. 39.

[2] F.D. Graham, *Exchange, Prices, and Production in Hyperinflation: Germany, 1920-1923* (Russell and Russell, New York, 1930), p. 24.

Table One. Stages in the Inflationary Process 1914-23

Stage	Dates	Main Features
Stage I. Steady but moderate Inflation	1914- November 1918	Total quantity of notes and coins in circulation increases about 400% Prices Double.
Stage II. Inflation accelerates slightly	November 1918-June 1919	Quantity of money in circulation rises 57%. Prices of internally produced goods rise 43% External value of Mark against dollar falls 50%.
Stage III. Inflation Accelerating	July 1919-February 1920	Quantity of money rises 33% Prices of internally produced goods rise 185% Value of mark against dollar falls 80%
Stage IV. Inflation slows significantly	February 1920-May 1921	Quantity of money rises 50% Mark rises in value against the dollar Prices rise about 7%
Stage V. Inflation Accelerates Sharply	June 1921-July 1922	Quantity of money rises 148% Prices rise about 700% Number of marks to a dollar rises nearly 700%
Stage VI. Very Rapid Inflation	July 1922-June 1923	Quantity of money rises 8400% Prices rise about 18,000 per cent Number of marks to a dollar rises 22,000%
Stage VII. Explosive Inflation	June 1923-November 1923	Prices rise over 800 billion % Number of marks to a dollar 1,000 billion.

Why did Hyperinflation Happen?

1. Growth in the Supply and Velocity of Circulation of Money

At one level the answer to this question is simple: the German inflation occurred because the supply of money dramatically exceeded the supply of goods and services available to purchase. Inflation happened because of a sustained and increasingly rapid growth in the supply of money, such that by 15 November 1923, the last day of the worst inflationary excesses, the total stock of money circulating in Germany was 92.8 quintillion marks (where a quintillion is 1,000,000,000,000,000,000). There was, absolutely, too much money chasing too few goods. Milton Friedman liked to say that inflation was always and everywhere a monetary phenomenon, and it would be astonishing if this were not true of the most notorious of all inflations. The monetary analysis of inflation is usually framed in terms of the Quantity Theory of Money as formalised by the American economist, Irving Fisher. The Quantity Theory of Money states that there exists a direct and proportionate relationship between the amount of money in an economy and the general level of prices. If the money supply goes up then the price level will follow and vice versa. The basic reason for this is that people are assumed to have a fixed demand for money to hold as cash balances. The rest they use for

Transaction purposes. If they receive more money than they wish to thus hold as cash they will spend the excess on goods and services – thus increasing total monetary demand relative to supply and causing prices to rise; whereas if the money supply falls and they receive less cash than they want, they will cut down their spending and prices will fall. According to Fisher's Equation of Exchange:

MV = PT

The left-hand side of this equation gives the total money demand for goods and services. It is calculated by multiplying the amount of cash currency and bank deposits in the economy (**M**) by the average number of times each unit of money is used in a given period (the Velocity of circulation - **V**). The right-hand side represents the total value of transactions in a given period of time, which is equal to the number of transactions in a given period (**T**) multiplied by the average Price per transaction (**P**). MV and PT are always equal as they are different ways of measuring the same thing: the total monetary value of transactions in an economy in a given period – i.e. in essence the value of output. Since the total number of transactions of goods and services is the same thing as the real output of goods and services, we can think of T as the real GDP of the economy, Y. In other words:

MV = PY or **P = MV/Y**

Fisher believed that this equation yielded a long run theory of the price level, P. This is because the Velocity of circulation (V) is assumed to be constant over a reasonable space of time, being determined by the efficiency of the banking system, the frequency with which people are paid, the speed of communications etc. Similarly, the level of real output (Y) is assumed fixed in the long run by the full-employment output of the economy as determined by real factors – the quantity of raw materials, the number of workers, level of technology etc. With V and Y thus fixed, it follows that if the stock of money (M) increases then the average level of prices (P) must rise. In the long run the direction of causality runs from M to P. Even if we assume (more realistically) that Y is not fixed in the short run, if the rate of growth of M and V exceeds the rate of growth of real output (Y) then the price level P will rise – inflation will occur. This is what happened in Germany from 1914 as the growth in the money supply outstripped the growth of output and inflation was the result.

There were two aspects to this: the rate of growth in the effective money demand due to the growth of M and V; and the fall or slow growth of Y. The two trends combined to yield an ever-more pronounced rise in the Price level, though of the two the increase in the circulating medium was much the most important.

The real output of the German economy was hindered by the war and post-war developments. The war itself caused a reduction in goods to purchase in the shops as output was diverted to munitions and the blockade imposed by the allies cut off access to foreign supplies and led to food shortages. Germany lost over a million men in the war, while the Treaty of Versailles saw Germany lose about one-eighth of its land area, including economically productive areas such as Alsace-Lorraine and Upper Silesia. In 1923 the German economy sustained a further severe blow when French and Belgian forces occupied the Ruhr to extract reparations in kind, provoking a wave of strikes and acts of industrial sabotage. And, of course, hyperinflation damaged the productive efficiency of the German economy through the uncertainty, misallocation of resources, and sheer stresses of doing business that it created. Thus, by 1920 industrial output was 64% of its 1913 level, and by 1924 was 82%.[1] Such supply-side limitations would have added to inflationary pressure with a given level of money-demand. But it should be noted that for the years 1919-22 total output was *growing* and unemployment very low by 1922, and that a reduction of output compared to pre-war levels of about a fifth cannot account for inflation rates in the millions of percent. For this an increase in either the Money supply or the Velocity of circulation are required – and Germany experienced both.

Table Two. Index Numbers for growth in Money Supply and Price Level in Germany 1914-October 1918 (1913 = 1)[2]

Date	Volume of Circulating Currency (1913=1)	Index of Internal Prices (1913=1)
1914	1.2	1.1
1915	1.5	1.4
1916	1.7	1.5
1917	2.5	1.8
1918	3.8	2.2
Jan. 1919	5.7	2.6
July 1919	6.9	3.4
Dec. 1919	8.3	8.0
Jan. 1920	8.4	12.6
July 1920	11.5	13.7
Dec. 1920	13.5	14.4
Jan. 1921	13.0	14.4
July 1921	14.3	14.3
Dec. 1921	20.3	34.9
Jan. 1922	20.5	36.7
July 1922	33.5	100.6
Dec. 1922	213.4	1,475
Jan. 1923	331.9	2,785
Apr. 1923	1,090	5,212
July 1923	7,231	183,510
Oct. 1923	854,402,000	18,700,000,000
27th Nov. 1923	245,107,000,000	1,422,900,000,000

This table shows the sustained growth in the nominal supply of paper marks in Germany – a growth which proceeded steadily in line with rising prices until the second half of 1922 when both it and inflation accelerated sharply. During 1923 the nominal money supply exploded as did prices – the supply of money increasing by a factor of 739 million and the price level by a factor of 511 million. During the same period the Velocity of circulation also increased rapidly – but not at first (see Table Three below). The Velocity of circulation of money declined through the war and reached its lowest point in June 1919, when it was 43% of the 1913 level. People were uncertain of the future, there was less in the shops to buy, and with the mark

[1] C.H. Feinstein, P. Temin, and G. Toniolo, *The European Economy Between the Wars* (Oxford University Press, Oxford, 1997), p. 60.
[2] Table derived from Graham, *Exchange, Prices, and Production in Hyperinflation* Table IV, pp. 156-159

gradually losing value there was an expectation its value would recover once the war was over and Germany had won. It then rose to about the 1913 level by the end of 1919 before reaching 85% above the 1913 level in February 1920. Velocity of circulation then fell again until, at the end of 1920, it is estimated that about 1/7 of the nominal supply of money was hoarded as cash.[1] By the summer of 1921 it was back to 1913 levels. From this point the Velocity of circulation of money accelerated exponentially: in March 1922 it was double the 1913 level; at the end of 1922 it was over six times; by July 1923 it was ten times, and by October 1923 it was 17 times the rate of 1913. Quite simply, as inflation reached exceptional levels no one wished to hold cash whose value was depreciating so rapidly and spent any marks as soon as they received them and ran down any cash balances they may have been saving.

Table Three. Velocity of Circulation of Money based on Wholesale Prices (1913 = 1.0)[2]

	1919	1920	1921	1922	1923
January ..	0·46	1·47	1·10	1·77	8·45
February ..	0·46	1·85	1·03	1·91	9·59
March ..	0·44	1·72	1·00	2·32	5·35
April ..	0·45	1·51	0·98	2·53	4·79
May ..	0·45	1·41	0·96	2·39	5·74
June ..	0·43	1·21	0·96	2·33	6·77
July ..	0·49	1·18	0·99	2·97	10·34
August ..	0·62	1·23	1·30	4·57	8·57
September ..	0·70	1·18	1·31	5·18	5·14
October ..	0·78	1·13	1·48	6·99	17·79
November ..	0·89	1·17	1·88	9·01	—
December ..	0·96	1·06	1·70	6·85	—

This acceleration in the speed of usage of money only compounded the rapid growth in the stock of money, with that result that effective money demand (MV) increased at ever-more dramatic rates from the second half of 1922 and, as the Quantity Theory predicts, when the growth in money demand so far outstrips the growth in physical output, the result is very rapid inflation. Equally, on 15 November 1923, when the new Rentenmark currency fixed in supply was introduced, the hyperinflationary process ended almost overnight.

So in one sense German hyperinflation is easy to explain: it occurred because there was a dramatic growth in the supply of notes, coins, and bank money, a growth which far outstripped the capacity of the economy to meet in terms of the growth of GDP, and the result was an immense fall in the value of the mark. The printing of money was thus what we might call the Efficient Cause of the inflation – the thing which materially caused it to happen and in the absence of which there could not have been an inflation on anything like the scale witnessed. But this begs the bigger question: why did it happen? Why did Germany, with one of the most developed economies in Europe and one of its most sophisticated banking systems, experience the collapse and ruin of its currency?

[1] Bresciani-Turroni, *Economics of Inflation*, p. 166.
[2] *Ibid.*, p. 168.

2. The Government's Budget Deficit

The War Period 1914-18

The roots of the German inflation lay in the First World War. During the war years, 1914-1918, total government spending was 164 billion marks and total income was 121 billion marks. The state was slow to raise taxes to pay for the war, partly because they assumed it would be short and would yield victory when they could recover the costs through reparations, and also because the central government's tax base was weak, with much tax raising powers devolved to the regional states. In fact, only one-eighth of war-time spending was covered by regular taxation. Some of the short-fall was met by war loans from the public, but an increasing amount was paid for by issuing short-term Three Month Treasury Bills. A Treasury Bill is a piece of paper entitling the holder to receive a regular payment of money from the government. These pieces of paper are bought by a payment which is, in effect, a loan to the government, and the regular payment they receive is the interest on that loan. At first these Treasury Bills were bought by private banks and businessmen as safe, income-yielding, investments. But as the quantity of Treasury Bills being issued increased (it reached 16 billion marks in the last year of the war) it became too large for the private sector to absorb, so a larger and larger share of these Treasury Bills (or what was called the 'floating debt') were bought by the official state bank, the Reichsbank. For most months up to 1922 the Reichsbank purchased about half of the Treasury Bill issue. How could the bank afford to purchase this ever-growing creation of Treasury Bills? Quite simply, by printing the money to do so. Thus, what happened was that the government was spending more than it was receiving in taxes; to cover the deficit it issued Treasury Bills which were bought by the Reichstag which paid for them by printing money. It was in this manner that the government's fiscal deficit resulted in the expansion of the money supply – and it was this which created the fundamental basis for inflation.

What made this inflationary printing of paper money possible were two laws passed on 4 August 1914 – at the very beginning of the war. The first suspended the convertibility of paper marks into gold. Previously the mark (like most European currencies) operated a gold standard, whereby a paper mark could be exchanged at the Reichsbank for a certain fixed amount of gold. Under such a system a large-scale printing of paper currency was impossible since, if ever the value of the paper currency began to decline, people could take the paper money to the bank and swap it for gold. But with war breaking out, and people seeking to convert paper money into gold for security, the Reichsbank was soon losing gold and could no longer guarantee convertibility. So the gold standard was suspended and with it went the check on the printing of paper money: henceforward the Reichsbank could print as much money as it wished since no one could bring it to the bank and exchange it for gold. The second law of 4 August authorised the bank to purchase three-month Treasury Bills from the state and pay for them by printing money. Previously not less than one-third of the Reichsbank's note issue had to be backed by gold. Now this stipulation was dropped and the purchased Treasury Bills themselves were considered backing for note issue. The more Treasury Bills the bank bought the more money it could create. Thus, writes Bresciani-Turroni, the 'Reichsbank became a pliable instrument in the hands of the Minister of Finance and renounced the functions of a central organ whose business it is to regulate the circulation of the country.'[1]

[1] *Ibid.*, p. 49.

'According to the weekly statements of the Reichsbank, in the two weeks from July 24th to August 7th the quantity of Reichsbank notes in circulation increased by more than two milliard [billion] marks. Thus was initiated a monetary inflation which was without precedent in history.'[1] In December 1914 the total value of paper currency in circulation was 5.8 billion; by the end of 1918 it was 32.9 billion.[2] Not surprisingly, by the war's end, wholesale prices in Germany were 117% higher than they were in 1913: prices somewhat more than doubled over the course of the war. However, this result was not peculiar to Germany. A similar inflationary process occurred among those countries involved in the war for similar reasons – many states left the gold standard and printed money to cover the huge expenditures required by the war.

Table Four. Index numbers of Wholesale Prices expressed relative to a base year of 1913 (1913 = 100)[3]

Monthly average	United Kingdom[2]	France	Italy	Germany	U.S.A.[3]	Canada	Japan	Sweden	India
1913	100	100	100	100	100	100	100	100	—
1914	100	102	96	106	98	100	95	116	100
1915	127	140	133	142	101	109	97	145	112
1916	160	189	201	153	127	134	117	185	128
1917	206	262	299	179	177	175	149	244	147
1918	227	340	409	217	194	205	196	339	180
1919	242	357	364	415	206	216	239	330	198
1920	295	510	624	1,486	226	250	260	347	204
1921	182	345	577	1,911	147	182	200	211	181
1922	159	327	562	34,182	149	165	196	162	180
1923[4]	159	411	582	765,000	157	167	192	166	179

[1] These figures are taken from the *Monthly Bulletin of Statistics* of the League of Nations.
[2] *Statist* up to 1919; thereafter the median of the *Economist*, *Statist*, and Board of Trade index numbers.
[3] Bureau of Labour index number (revised).
[4] First half-year.

As is apparent from Table Four, Germany's inflationary experience was not exceptional – in fact, it incurred less inflation over the war than the UK, France, or Italy. It was in the immediate post-war years that Germany's inflationary experience (and indeed that of Austria, Hungary, and Russia) diverged so dramatically from that of the victorious powers.

The Post-War Period 1918-23

What is important is that the end of the war did not mark an end to the inflationary budgetary policy in Germany; if anything, it was just beginning. The revolution of November 1918 saw

[1] *Ibid*., p. 23.
[2] Graham, *Exchange, Prices, and Production in Hyperinflation*, p. 7.
[3] This table is taken from J.M. Keynes, *A Tract on Monetary Reform* (Collected Writings of John Maynard Keynes Volume IV, Macmillan, 1971), p. 3.

the collapse of the German monarchy and the assumption of power by a provisional Social Democratic Party-led government. Struggling to maintain order whilst having to purchase food for distribution to the poor, deal with the return of millions of demobilised soldiers, the bankruptcy of state services like the railways and post office, the disruption of the administrative system, and facing the political impossibility of significantly raising taxes in a country where real incomes were about half of their 1913 level, the new government had little choice but to turn to the issue of Treasury Bills, and thus the printing of money, to acquire the funds it needed. In November and December 1918 alone the money supply increased by 24%. The short-term debt continued to increase: between November 1918 and March 1919 the floating debt rose by 15.6 billion paper marks (or 7.7 million gold marks). In terms of the development of German inflation, this was the key moment. 'The upward march of the floating debt', comments Graham, 'was never once interrupted from the end of the war till the currency reform in November 1923.'[1] Far from inflationary war finance ending, to be succeeded by retrenchment, it accelerated in peace time.

Table Five. Discounted Treasury Bills Outstanding and Issues of Reichsbank Notes 1919-23 (in Billions of paper marks)[2]

END OF	1919		1920		1921		1922		1923	
	DIS-COUNTED TREASURY BILLS OUT-STANDING	REICHS-BANK NOTE ISSUES	DIS-COUNTED TREASURY BILLS OUT-STANDING	REICHS-BANK NOTE ISSUES	DIS-COUNTED TREASURY BILLS OUT-STANDING	REICHS-BANK NOTE ISSUES	DIS-COUNTED TREASURY BILLS OUT-STANDING	REICHS-BANK NOTE ISSUES	DISCOUNTED TREASURY BILLS OUTSTANDING	REICHSBANK NOTE ISSUES
Jan.	59	24	88	37	156	67	256	115	2,082	1,985
Feb.	62	24	89	41	162	67	263	120	3,588	3,513
Mar.	64	25	92	45	166	69	272	131	6,601	5,518
April	67	27	95	48	173	71	281	140	8,442	6,546
May	70	28	102	50	177	72	290	152	10,275	8,564
June	73	30	113	54	185	75	295	169	22,020	17,291
July	76	29	123	56	191	77	308	190	57,849	43,595
Aug.	78	28	129	58	203	80	332	238	1,196,295	663,200
Sept.	81	30	138	62	211	86	451	317	46,716,616	28,228,816
Oct.	83	31	141	64	218	92	604	469	6,907,511,103	2,496,822,900
Nov.	85	32	148	64	227	101	839	754	191,580,465,422[44]	400,267,640,300
Dec.	86	36	153	69	247	114	1,495	1,280		496,507,424,800

[44] As of November 15.
Sources of data: (1) *Germany's Economy, Currency and Finance*, p. 63. (2) *Zahlen zur Geldentwertung in Deutschland* 1914 *bis* 1923, p. 46.

Between 1919 and 1920 a series of new taxes and reforms were brought in by the Minister of Finance, Matthias Erzberger. Erzberger, a leader of the Catholic Centre Party who had signed the Armistice with the Allies on 11 November 1918, sought to strengthen the fiscal basis of the state, first by asserting the power of the central government to tax and spend independent of the local states, and second, by shifting the burden of taxation from those of low and middle-income by imposing taxes on inheritance and wealth. However, these tax reforms were slow to prepare and implement and generated much opposition from the rich, and Erzberger, already hated by the Right for signing the Armistice, was shot dead by a nationalist gunman in the Black Forest in 1921. Although government revenue did rise during 1920, government

[1] Graham, *Exchange, Prices, and Production in Hyperinflation*, p. 45.
[2] Table from *ibid.*, p. 46.

spending rose even faster and 60% of this spending was covered by Treasury Bills. The paper circulation of money rose by a further 20 billion in the financial year 1920-21. From 1922 the share of Treasury Bills purchased by the Reichsbank rose rapidly, from 49% in January 1922 to 79% by December. By the peak of hyperinflation in November 1923 it was 99%. The below chart summarises the allocation of government Treasury Bills between 1920 and 1922.

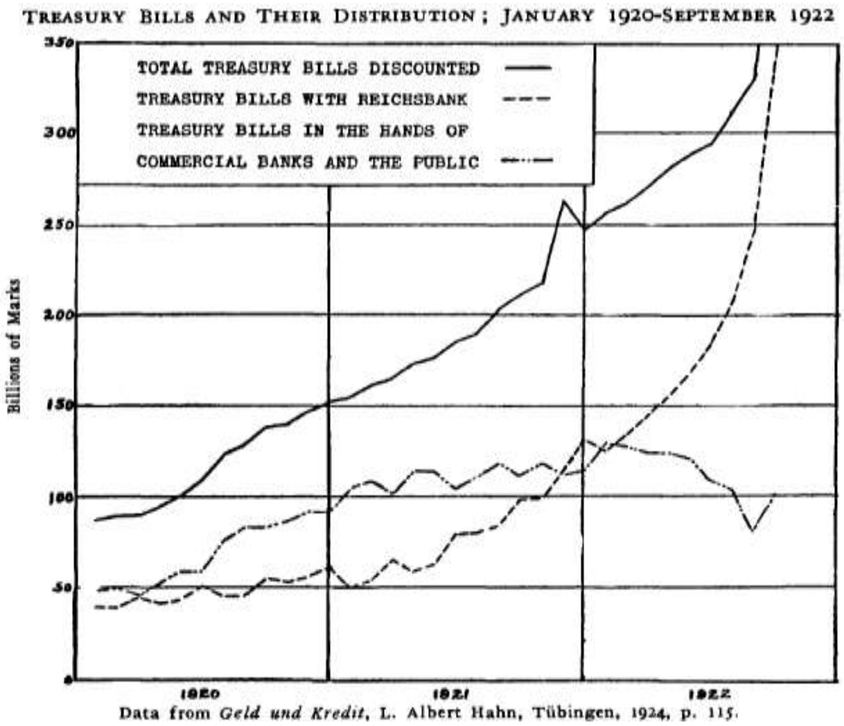


Diagram Two. Distribution of Treasury Bills issued between 1920 and 1922[1]

As Table Six illustrates, at no point between 1919 and 1923 were the Reich's finances close to being in balance; expenditure continually exceeded income and the difference was primarily met through the purchase of Treasury Bills by the Reichsbank.

Table Six. Income and Expenditure of the Reich 1919-1923 (in Billions of gold marks)

Financial Year	Reich Income	Reich Expenditure	Increase in Floating Debt
1919-1920	2.6	8.6	6.0
1920-1921	3.2	9.3	6.0
1921-1922	2.9	6.7	3.7
1922-1923	1.5	4.0	2.4
1923-Oct 1923	0.5	5.3	4.7

The figures in this table are in fixed gold-mark values, so they are independent of inflation. What is notable is the scale of the government's fiscal deficit in real terms, the corresponding

[1] *Ibid.*, p. 61.

importance of Treasury Bills as the means of finance, and, finally, the collapse of the government's revenues in real terms from 1922 onwards as inflation wreaked havoc upon the tax-collecting system. Even when taxes were levied and collected, by the time the money was actually received its real value had been degraded by inflation. By 1923 nearly all government spending (98% in October 1923) was financed out of Treasury Bill sales to the Reichsbank – i.e. by printing money. And this, really, is the essence of what was happening during the years 1918-1923. The central government needed considerable sums of money to deal with the multitude of problems arising out of the war. Yet this new, inexperienced, and left-of-centre government lacked the support or strength during these turbulent and testing years to raise the funds necessary to pay for such spending through taxation. Or rather, it found in inflation an *alternative form of taxation*. When a government taxes it directly helps itself to a share of the income people receive so that, instead of these private persons or businesses being able to use that income to purchase goods or services they want, the government acquires that money and uses it to buy the goods and services *it* wants. Printing money works the same way. When a government prints money it manufactures a claim on real resources – it can use the money it has printed to purchase what it likes, from providing health care to pensions to war widows to funding the police or public highways. And just like taxation, the more money the government prints the more resources the government can command and the less are left for private individuals to buy with their money. While in nominal terms a person's take-home salary stays the same (unlike under taxation, where the deduction is obvious), in *real* terms their salary is reduced since the government's demand for goods and services made possible by printing money will cause the prices of those goods and services to rise – so that when the private citizen goes to spend their salary in the shops they will find they can afford to buy less than before. By printing money the government has provided itself with revenue which it can use to buy things – but this doesn't increase the total stock of things to buy, and the effect is greater demand chasing a given amount of output, and inflation occurs, reducing the real incomes of everyone, including the government, so a further printing of money then becomes necessary and so on. This point was emphasised by John Maynard Keynes in his *Tract on Monetary Reform* which was published in 1923 during the middle of the worst months of the German hyperinflation:

> A government can live for a long time, even the German government or the Russian government, by printing paper money. That is to say, it can by this means secure the command over real resources, resources just as real by those obtained by taxation. The method is condemned, but its efficacy, up to a point, must be admitted. A government can live by this means when it can live by no other. It is the form of taxation which the public find hardest to evade and even the weakest government can enforce, when it can enforce nothing else … The burden of the tax is well spread, cannot be evaded, costs nothing to collect, and falls, in a rough sort of way, in proportion to the wealth of the victim … In the middle of 1922 I estimated, very roughly, that the German government had been obtaining for some time past the equivalent of something between £75 million and £100 million per annum by means of printing money.[1]

An inflationary printing of money did not merely represent a source of revenue to the state; it also reduced the real value of its outstanding debt which was specified in nominal values. So, even though the government finances were in deficit, during the inflationary years the large

[1] Keynes, *Tract on Monetary Reform*, pp. 37, 39, 50

debts incurred during and after the war were entirely liquidated by the destruction of the currency in which they were denominated. Even by October 1920, when the total national debt stood at 287 billion marks, a figure which, before the war, was the equivalent of £14.4 billion, due to inflation and currency depreciation it was only in fact worth £1.2 billion.[1] By 15 November 1923, when the national debt stood nominally at quintillions of marks, when converted to dollar values it amounted to less than $50 million.[2] The real national debt of Germany had been inflated away.

It is easy to see why the newly formed Weimar governments might have had recourse to printing money in the aftermath of war. The problem was that they couldn't help themselves becoming addicted to the process, and this addiction, like many others, tended in only one direction: a disastrous overdose. Several factors conspire in this way. First, having found it so much simpler politically to simply print money rather than raise the real burden of taxation the government will be inclined to have further recourse to printing money rather than raise taxes or cut government spending programmes. Second, printing money raises the price level generally, including, obviously, the things the government needs to buy and the salaries it has to pay, so henceforth the government will need to print even more money to command the same real amount of resources – and so inflation accelerates. Third, people are at first caught-out by the unexpected inflation caused by printing money and find themselves poorer in real terms as a result. But they learn from this and begin to find ways to avoid being hit by future waves of inflation: they spend any money they receive much more quickly (the Velocity of circulation rises) so raising prices further and reducing the government's command over resources; they demand pay rises to match the inflation, pushing up prices even more; they begin to use alternatives to paper money for purchases (such as foreign currency or local token-money produced by shops or firms) and this means the government can buy less and less with its discredited paper money. Fourth, as inflation rises faster and faster the efficiency of the economy declines and the real value of total output will start to fall, so even if the government can claim a given share of resources, the absolute amount of the government's real income will fall. The prognosis is clear: to achieve a given level of income in real terms the state must engage in successively larger issues of paper currency, driving up inflation to ever higher rates, until eventually the economy adjusts in such ways as to make the policy unsustainable and unable to realise its purpose – to fund the state. At this point it will be abandoned, as it was in Germany in November 1923.

Thus, the essential inflationary mechanism becomes clear. The German inflation was caused by an excessively large note issue by the Reichsbank, which was called upon to print money to purchase ever-greater numbers of Treasury Bills issued by a government unable or unwilling to fund its expenditure out of regular taxation. This was the core narrative of 1919-23. Yet, it was not the only narrative and it was not the story Germans themselves about what was happening to them. To this we now turn.

[1] A. Fergusson, *When Money Dies: The Nightmare of the Weimar Hyper-Inflation* (Old Street Publishing, London, 2010), p. 35.
[2] Graham, *Exchange, Prices, and Production in Hyperinflation*, p. 47.

3. The Depreciation of the Mark

If a German were asked what was the chief cause of the inflation they were experiencing they would answer: it was caused by the fall in the external value of the mark. And this fall was precipitous indeed, as Table Seven shows.

Table Seven. The Exchange Rate of the Mark against the Pound and Dollar 1914-1923 (Note that a Milliard is now called a Billion, and a Billion is now called a Trillion)[1]

	MARKS TO £1	MARKS TO $1
Pre-war parity	20.429	4.198
1915 – Jan	–	4.59
1916 – Jan	–	5.36
1917 – Jan	-	5.53
1920 – Feb	340	100.5
Apr	240	60.5
Jun	160	40.25
Oct	240	70.45
1921 – Jan	215 – 262	57 – 74
Jun	245 – 280	63 – 75
Oct	463 – 712	124 – 180
1922 – Jan	790 – 862	186 – 201
Feb	873 – 1009	204 – 227
Mar	1022 – 1485	230 – 338
Jul	1770 – 2975	402 – 670
Aug	2860 – 8850	644 – 1975
Oct	7925 – 20,350	1815 – 4500
Dec	31,000 – 39,000	6750 – 8470
1923 – Jan	32,000 – 225,000	6890 – 48,390
Jun	265,000 – 900,000	57,000 – 193,500
Aug	4.5 million – 52 million	900,000 – 11.4 million
Oct	1 milliard – 800 milliard	250 million – 170 milliard
Dec	15 billion – 25 billion	3.43 billion – 5.72 billion
1924 – Jan	19 billion	4.47 billion

Whereas there were just over four marks to a dollar in 1913, by the end of February 1920 there were 100 marks to the dollar, and by November 1923 there were about four trillion – at which date 42 billion marks would buy you just one cent. Little wonder the average German attributed their woes to the collapse in the purchasing power of their currency! And it is the case that a fall in the external value of a currency will cause the price of imported goods to rise. This can be easily shown. Suppose there are initially 4 dollars to one mark, and that Germany is buying 1000 tons of wheat from America priced at $400. Given that there are 4 dollars to a mark, that wheat will sell for 100 marks in Germany. Let us now assume that the mark loses value against the dollar, so that a mark is now worth $2 and not $4. In this case wheat to the value of $400 will now convert to a mark price of 400/2 = 200 marks. The mark price of imported wheat has doubled due to a 50% fall in the external value of the currency. Thus, a fall in the external value of the mark would translate into a rise in the cost of imported goods. And this is exactly what happened.

[1] https://marcuse.faculty.history.ucsb.edu/projects/currency.htm

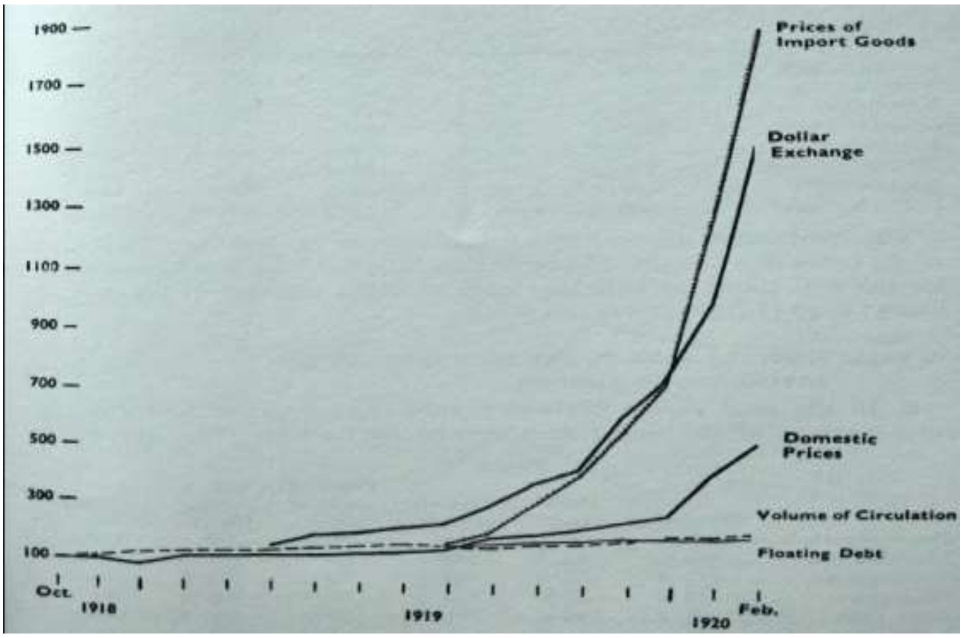


Diagram Three. Index Values for Prices of Imported Goods, Prices of Domestically produced goods, the number of Marks to the Dollar, the Volume of Cash in Circulation and the Floating Debt, with 1918 = 100.[1]

Clearly visible in Diagram Three is the pronounced tendency of the mark to lose value against the dollar from the spring of 1919. Between October 1918 and January 1920 the mark lost 90% of its value and in the same period the price of imported goods rose twelve-fold. By contrast, between February 1920 and August 1920 the mark rose 50% against the dollar and the price of imported goods fell by 50%. On balance, however, the external value of the mark fell over the years 1918 to 1923 – eventually catastrophically – and this did have the effect of putting upward pressure on the price level within Germany. So why did this fall in the value of the mark happen? Was this, then, as many Germans believed, the primary cause of inflation?

i. The Role of the Balance of Payments

In the wake of the war it wasn't only the government budget that was in deficit; the balance of payments was in deficit too. The balance of payments refers to the flow of marks out of Germany to buy foreign currency to purchase goods from other countries to import into Germany, compared to the demand from other countries to buy marks to purchase products made in Germany for export. The ending of the war revealed Germany to be experiencing a balance of payments deficit: the value of goods and services being exported by Germany was less than the value of goods and services being imported into Germany. Germans tended to attribute the fall in the mark and hence inflation to the weakness in the balance of payments, which were in deficit in current account from 1914 onwards. From 1914 to 1918 imports of goods exceeded exports by 15 milliard gold marks. This was natural in the context of a war economy, as Germany struggled to supply its armies with munitions and its population with basic necessities. Imports continued at a high level after the war as the effects of the Allied trade blockade pushed Germans towards starvation, while the German and European

[1] Bresciani-Turroni, *Economics of Inflation*, p. 29.

economies were highly disrupted, making exporting difficult. Between 1919 and 1922 the total deficit in the balance of payments was 11 billion gold marks. Such a deficit in the balance of payments causes the supply of marks to buy foreign currency to exceed the demand from foreign currency to buy marks, and the result will tend to be a fall in the value of the mark exchange rate against international currencies like the dollar or pound. This, as we have seen, directly caused prices within Germany to rise, and this in turn provoked demands for wages to rise and raised costs to firms which were then passed on as higher prices. The balance of payments deficit was thus viewed an integral to the inflationary experience.

It is true, of course, that the balance of payments deficit did cause downward pressure upon the external value of the mark, and this, in turn, did generate upward pressure on prices. However, it was not the case that hyperinflation was a *result* of the balance of payments deficit. Three points count against this explanation:

1. Although the balance of payments was negative from 1918 to 1921, from 1922 it was in balance. In 1922 total imports and exports were each valued at 6.2 million gold marks. Between January and October 1923 exports and imports were again roughly equal. Yet, as Bresciani-Turroni comments, 'the depreciation of the mark not only continued but did so more rapidly than ever before.'[1]
2. While it is true that rising import prices raised the internal price level, this process could not have generated rapid and indeed accelerating inflation unless the money supply had increased. If the money supply had not increased, the rise in the price of imported goods would soon have reached a point at which they would have become unaffordable, and certainly a corresponding rise in the prices of domestically produced goods and wages and profits could not have been accommodated without a growth in money demand. 'It was only', says Bresciani-Turroni, 'due to the rise in money incomes, which was the consequence of the increase in the circulation, that it was possible that imported goods, which were sold at rising prices, because of the depreciation of the exchange, could find buyers.'[2]
3. The balance of payments deficit itself was in part a product of the inflationary printing of money. Raising money incomes within Germany led to higher demand for imported goods whilst at the same time raising German prices against those of other countries. Any country inflating relative to other countries will tend to experience balance of payments problems, which in turn tend to lower the exchange rate as a corrective to restore equilibrium. So far from being a cause of the inflation, the balance of payments deficit was a consequence of it.

In his 1956 study of seven hyperinflations, including that of Germany, Phillip Cagan concludes that the causality was from internal prices to the exchange rate. An 'extreme rise in prices', he writes, 'depends almost entirely on changes in the quantity of money … the rise in wages and the depreciation of the foreign exchange-rate in hyperinflations are effects of the rise in prices.'[3]

[1] *Ibid*., p. 87.
[2] *Ibid*., p. 90.
[3] P. Cagan, 'The Monetary Dynamics of Hyperinflation', in M. Friedman (ed.), *Studies in the Quantity Theory of Money* (The University of Chicago Press, Chicago, 1956), p. 91

ii. The Impact of Reparations

Under the reparations settlement, finalised in May 1921, Germany had to pay the Allies a sum totalling £6.6 billion or 132,000,000,000 gold marks to compensate for the civilian damage caused by the war. These payments were to begin in 1921 with an immediate cash payment of one billion gold marks (or the equivalent in foreign currency), followed by two billion gold marks per annum and an additional sum of 26% of the value of German exports. Reparation payments in kind (physical goods) had already begun by this date – they had an estimated money value of 2.6 billion marks by May 1921. This, in itself, acted to depress the value of the mark, since if these goods had been sold regularly on the open market then they would have created an additional demand for marks, so raising the exchange rate. From May the payment of reparations in gold and foreign currency began, and by the end of October the immediate cash payment of one billion had been made. The next payment due was 500 million at the end of January 1922, but in December 1921 the Weimar government said it would be unable to make this payment and asked for a postponement. In response the Allies agreed to a temporary arrangement whereby the Germans would pay 31 million gold marks every ten days. But this arrangement didn't last long: in June 1922 the German Foreign Minister, Walter Rathenau, was assassinated. 'His 'death', writes Graham, 'turned pessimism into panic.'[1] The mark fell rapidly in value and the government's position weakened further. The last reparations payment was made on 15 July 1922. From this point the cash payment of reparations ended until after the hyperinflation was over.[2]

How, then, did reparations contribute to the German inflation?

1. First, the payment of reparations added to the fall in the value of the mark and accelerated the rise in prices. The reason for this is that, in order to get the foreign currency to pay the reparations, the government needed to purchase it with paper marks. Thus, of the one billion's worth of gold marks paid in 1921, 541 million was made up of foreign currency purchased by the Reichsbank with marks. This impacted on the inflation rate in two ways: first, to get the necessary paper marks the government had to borrow them through issuing Treasury Bills, so leading the Reichsbank to print the marks needed; and second, by increasing the supply of marks on the currency markets the state helped to drive down the value of the mark – which raised prices as we have discussed. If the money for reparations had been raised through internal taxation then the first effect would have been eliminated and the second reduced (since private demand for imports would have declined), but, as we have seen, the Weimar government was unable to cover its usual spending let alone those reparation demands by taxation. Instead, it turned to borrowing and printing money. Graham attaches particular importance to this:

> There is … every reason to believe that, apart from the recurring impositions of the Treaty of Versailles, a budgetary balance would have been achieved and inflation checked. Tax revenues in 1920 yielded the equivalent of 4090 millions of gold marks and in the following year 5235 millions. Expenditures in 1921, exclusive of the deficit of the state railways and payments under the Treaty of Versailles, were equal to 5738 million gold marks. The railway deficit was eliminated in the following year. Leaving it out of account, the ratio of taxes to outlays for domestic purposes in 1921 was 91.2%,

[1] Graham, *Exchange, Prices, and Production in Hyperinflation*, p. 34.
[2] *Ibid*., p. 34.

> an achievement which compared very favourably with that of the victor nations. The expenditures under the treaty, however, were themselves approximately equal to all other expenditures combined, and therefore to the total yield from taxes. Unless the improvement in the finances could proceed steadily forward the handwriting on the wall was clear and startling.[1]

Even Bresciani-Turroni, who, as a member of the League of Nations Reparations Commission, was generally sceptical of the importance of reparation payments in the fall of the mark, admits that the payment of the billion gold marks in 1921 'exercised an appreciable influence on the German exchange …'[2] However, he remains clear that the deterioration of the government's finances and the value of the mark were not primarily caused by demands of reparations. He points out, first, that taking a longer view, of the 18.7 billion gold-mark increase in the government's floating debt between 1920 and 1923, only 6.5 billion was due to all the costs imposed on Germany by the Treaty of Versailles. On average a third of the government's debt was due to the costs imposed by the Allies.[3] Graham agrees that, while in 1921 the government finances would have approached balance in the absence of reparation payments, from 1922 the hope of fiscal balance evaporated as tax revenues in real terms lagged hopelessly behind spending.[4] Second, the government was already in substantial debt, and the mark was already losing value, *before* the Treaty of Versailles was even signed. Third, the German government only paid 1.5 billion in gold marks during 1921. It paid a further 50 million in May and June of 1922. Such payments were not enough, and were not frequent enough, to explain the fall of the mark. Indeed, the period 15 July to 31 August 1922 saw a rapid fall in the mark when no reparations were being paid at all. Graham concurs: 'inflation had … proceeded far before any cash reparations whatever had been paid and it was accelerated after they had been entirely suspended.'[5]

2. Reparations also exerted a negative impact upon German finances from 11 January 1923 when the French and Belgian armies, responding to the suspension of cash reparation payments by the German government, occupied the Ruhr region in the Rhineland to extract reparations in kind. The Ruhr was Germany's most important economic region, accounting for 85% of its coal and 80% of its steel and iron production. Hence, the invasion of the Ruhr, says Bresciani-Turroni, 'gave the *coup de grace* to the national finances and the German mark'.[6] Multiple forces operating to destroy the German currency now converged:
    a. Government tax revenues fell still further as the economy of the Ruhr ground to a halt under passive resistance to French and Belgian occupation and the loss of revenues generated by the taxes on coal and exports.
    b. Foreign exchange earnings fell as the French and Belgians helped themselves to the output of coal and iron and output in other sectors of the Ruhr fell.
    c. The state, to support those firms and workers resisting the French, gave them subsidies – which of course were funded by printing money. The total money

[1] *Ibid.*, pp. 37-38.
[2] Bresciani-Turroni, *Economics of Inflation*, p. 96.
[3] *Ibid.*, p. 93.
[4] Graham, *Exchange, Prices, and Production in Hyperinflation*, p. 38.
[5] *Ibid.*, p. 30.
[6] Bresciani-Turroni, *Economics of Inflation*, p. 62.

supply increased five-fold between the beginning of January and the end of April 1923. By the end of April 1923 75% of all Treasury Bills being issued were bought by the Reichsbank by printing money, and in September five-eighths of the money raised through the sale of Treasury Bills was being used to fund passive resistance in the Ruhr.[1] While, writes Graham, 'it is impossible to censure the German decision to resist the invasion to the limit but the abandon with which mark credits and Reichsbank notes were flung about was nothing short of financial insanity.'[2]

d. The entry of French and Belgian forces into the Ruhr precipitated a further loss of confidence in the German economy and its currency. People sought to discard the mark in favour of foreign currencies. Much of this selling of marks was done by Germans themselves. In the wake of the Ruhr occupation, says Bresciani-Turroni, 'the purchase of foreign exchange by the public assumed the proportions of a pathological phenomenon.'[3] At the beginning of January there were 6890 marks to a dollar; by the end of January there were 49,000; and by the end of June there were 193,500.

The events consequent upon the Ruhr occupation do highlight the importance of reparations in the hyperinflation story. The occupation worsened Germany's balance of payments, reduced the tax revenue of the state, increased the supply of money, and provoked a flight from the mark. Yet, again, the significance of these events should not be exaggerated. To begin with, there had been flights from the mark before, and the flight from the mark would assume far larger proportions in the autumn of 1923. Not unnaturally, the German population became increasingly wary of holding marks that were continually losing value and any political or economic event had the capacity to trigger a move to convert depreciating narks into more dependable foreign currencies. Indeed, by the later stages of the hyperinflation German firms and consumers were discarding the use of marks altogether and using foreign currency instead. This was a phenomenon far wider than simply the effects of the Ruhr occupation. To quote Bresciani-Turroni:

> At certain times, as in October 1921, July and August 1922, and in January 1923 after the occupation of the Ruhr, the purchase of foreign exchange by the public assumed the proportions of a pathological phenomenon. The feverish acquisition of foreign exchange explained in great part the rapid fall of the mark which occurred at these periods. The situation of the foreign exchange market then appeared completely dominated by the purchases of the public, which were the consequence of the panic created by political events. The very rapid and sharp depreciation of the mark was mainly at those times due to psychological causes, operating especially in Germany … the impetus for the rise of the dollar originated in the German bourses and not in foreign markets … [4]

Further, Bresciani-Turroni points out that the real factor here was not the occupation, it was the policy of passive resistance and the decision to fund that resistance by

[1] Fergusson, *When Money Dies*, p. 183.
[2] Graham, *Exchange, Prices, and Production in Hyperinflation*, p. 76.
[3] Bresciani-Turroni, *Economics of Inflation*, p. 88.
[4] *Ibid.*, pp. 88-89.

printing money. 'Thus, contrary to the opinion of many writers, the financial policy of the German Government was a fundamental factor also in the last phase of the depreciation of the mark.'[1] Had the policy of passive resistance been funded out of increased taxation the descent into hyperinflation would have been avoided. But in the context of a government unable to balance its books even in normal times this was simply unfeasible. If the printing of money to fund passive resistance was inevitable, so, too, was the accelerating inflation it brought in its wake.

But for most Germans, the Ruhr occupation, following directly upon what they considered to be the iniquitous terms of the Versailles Treaty, and the collapse of the external value of the mark, only confirmed them in their view that hyperinflation was something that had been imposed *upon* Germany from outside, that inflation was something that happened *to* Germany the causes of which lay in the war and the unfair burden the Allies had placed upon their nation. This psychology of inflation was important for it encouraged a sense of fatalism – that there was nothing Germans could do to arrest this destruction of their monetary system. More important still: it chimed with the understanding of what was happening to Germany that was held, not just by ordinary citizens, but by bankers, financiers, journalists, politicians, and economists. For there existed within Germany a theory of inflation which was the opposite that held by most economists within the Allied countries or indeed among economists of the Classical or Neo-Classical traditions then and now. This theory provides the final clue to the question of how it was that German politicians, financiers, and bankers were seemingly complicit in the destruction of their own currency.

4. The German Theory of Inflation

As we have seen, it was the basic view held in Germany that the inflation of the years 1914 to 1923 was caused by the depreciation of the mark due to a deficit in the balance of payments. This was the view of the Reichsbank, government officials, bankers, industrialists, and the press. The war had caused a balance of payments deficit and to this had been added the burdens of Versailles and, from 1921, the payment of reparations to the victorious powers – and the result was depreciation and inflation. The idea that inflation and depreciation were caused by printing too much money was not widely accepted. There was not seen to be a causal relationship between printing money and the depreciation of the mark. If anything, *the causality was the opposite*: it was the balance of payments deficit, and the consequent rise in the price of goods, that *caused* the increase in the money supply. This mind set, says Bresciani-Turroni, reflected the prevalence within German theoretical circles of a 'qualitative' rather than quantity theory of money – a view that the value of money was not due to simply the quantity of it, but the historical operation of the whole complicated economic structure. Put simply: the quantity theory of prices and the exchange rate was not accepted in Germany. As Karl Helfferich, a banker and politician who served as State Secretary for Finance from 1915 to 1917, where he oversaw the policy of borrowing rather than taxing to pay for the war, and who after the war led the right-wing German National People's Party, wrote in the sixth edition of his book *Money* in 1923:

> The increase of the circulation has not preceded the rise of prices and the depreciation of the exchange, but it followed slowly and at great distance. The circulation increased from May 1921

[1] *Ibid*., p. 63.

> to the end of January 1923 by 23 times; it is not possible that this increase had caused the rise in the prices of imported goods and of the dollar, which in that period increased by 344 times … The depreciation of the German mark in terms of foreign currencies was caused by the excessive burdens thrust onto Germany and by the policy of violence adopted by France; the increase of the prices of all imported goods was caused by the depreciation of the exchanges; then followed the general increase of internal prices and of wages, the increased need for means of circulation on the part of the public and of the State, greater demands on the Reichsbank by private business and the State and the increase of the paper mark issues. Contrary to the widely held conception, *not inflation but the depreciation of the mark was the beginning of this chain of cause and effect*; inflation [of the currency] is not the cause of the increase of prices and of the depreciation of the mark; but the depreciation of the mark is the cause of the increase of prices and of the paper mark issues.[1]

Karl Helfferich (1872-1924)

This view was held in the press and in government. On 16 August 1922 the respected liberal newspaper, the *Vossische Zeitung*, declared that:

> The opinion that the flood of paper is the real origin of the depreciation is not only wrong but dangerously wrong … Both private and public statistics have long shown that for the last two years the interior depreciation of the mark is due to the depreciation of the rate of exchange … It should be remembered today that our paper circulation, although it shows on paper a terrifying array of milliards, is really not excessively high … We have no 'dangerous flood of paper' but, on the contrary, our total circulation is at least three or four times as small as in peace time.[2]

While a memorandum by the Central Statistical Office stated: 'The fundamental cause of the dislocation of the German monetary system is the disequilibrium of the balance of payments. The disturbance of the national finances and the inflation are in their turn the consequences of the depreciation of the currency.'[3] This belief, that the depreciation of the mark was due to disequilibrium in the balance of payments, for a long time prevented any serious consideration of monetary reform. The Reichsbank, which one might have expected to exercise a restraining

[1] Quoted *ibid.*, pp. 44-45.
[2] Quoted in Fergusson, *When Money Dies*, p. 89.
[3] Bresciani-Turroni, *Economics of Inflation*, p. 45.

influence upon the printing of money, instead believed that the balance of payments needed to be stabilised, not the issuing of money. In August 1922 its President, Rudolph Havenstein, declared it was not possible to stabilise the exchange until Germany secured a solution to the reparations problem. Fatalistic ideas dominated government circles, according to which Germany's ills were the result of the avaricious and unprincipled actions of the victorious Allies – and the French in particular. To quote Helfferich:

> Inflation and the collapse of the exchange are children of the same parent: the impossibility of paying the tributes imposed on us. The problem of restoring the circulation is not a technical or banking problem; it is, in the last analysis, the problem of the equilibrium between the burden and the capacity of the German economy for supporting this burden.

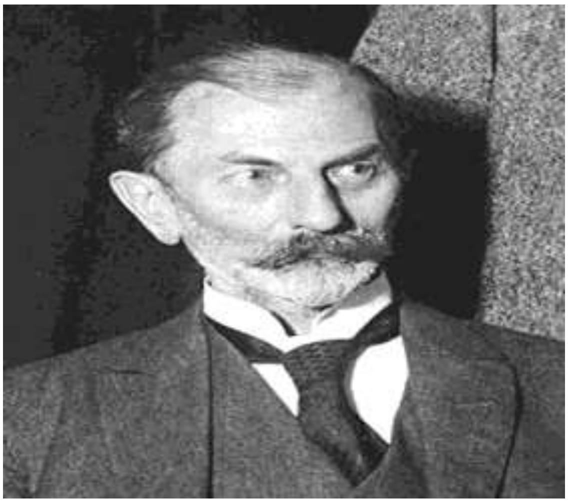
Hence it was that the Reichsbank found itself, by October 1923, in the absurd position of having for its monetary target the unlimited printing of money. It saw hyperinflation, not as a product of its own monetary policy, but as the result of the falling value of the mark due to the burdens placed upon Germany by the war and the post-war behaviour of the Allies and international bankers, and from this it inferred that its role was a passive one – namely to print in ever larger quantities the money the economy needed as it operated at higher and higher levels of prices. The problem, bizarrely, was not a surfeit of money but a shortage. Failure to print enough money would leave the economy short of cash and the result would be an economic collapse, with mass bankruptcies, soaring unemployment, and social unrest. Indeed, the Reichsbank was not only printing money to discount government Treasury Bills – it was also printing money to discount Commercial Bills issued by private companies. The value of Commercial Bills discounted (i.e. purchased by the bank) increased dramatically from 1922, from 2.2 billion marks in March 1922 to 697 billion in January 1923 and 347,301,037,776 billion marks.[1] Wherever there was a demand for cash, whether in government or private business, the Reichsbank was keen to supply it. In late August 1923 Havenstein, in a speech to the Central Committee of the Reichsbank that could have just as well have appeared in *Alice Through the Looking Glass*, reflected that:

> The whole extraordinary depreciation of the mark has naturally created a rapidly increasing demand for additional currency, which the Reichsbank has not always been fully able to satisfy. A simplified production of notes of large denominations enabled us to bring ever greater amounts into circulation. But these enormous sums are very adequate to cover the vastly increased demand for the means of payment, which has just recently attained an absolutely fantastic level, especially as result of the extraordinary increase in wages and salaries. The running of the Reichsbank's note-printing organisation, which has become absolutely enormous, is making the most extreme demands on our personnel.[2]

The Reichsbank was like a dog chasing its own tail: the faster it ran its printing presses the faster the goal of supplying enough money receded. By the end, though Germany was drowning in money, with notes to the value of 400,000,000,000,000,000 being printed each day, still there wasn't enough and there never could be, since the more money there was, and the faster the velocity of circulation, the higher were nominal prices. The only solution remaining was to put the monetary system out of its misery and it was sadly fortuitous that

[1] Graham, *Exchange, Prices, and Production in Hyperinflation*, p. 63.
[2] Quoted in Fergusson, *When Money Dies*, p. 175.

Havenstein, the Reichsbank President who had overseen the project of chasing prices by printing marks, should have died on 20 November 1923 at precisely the climactic end of his own disastrous policy. Under his successor, Hjalmar Schact, hyperinflation ended.



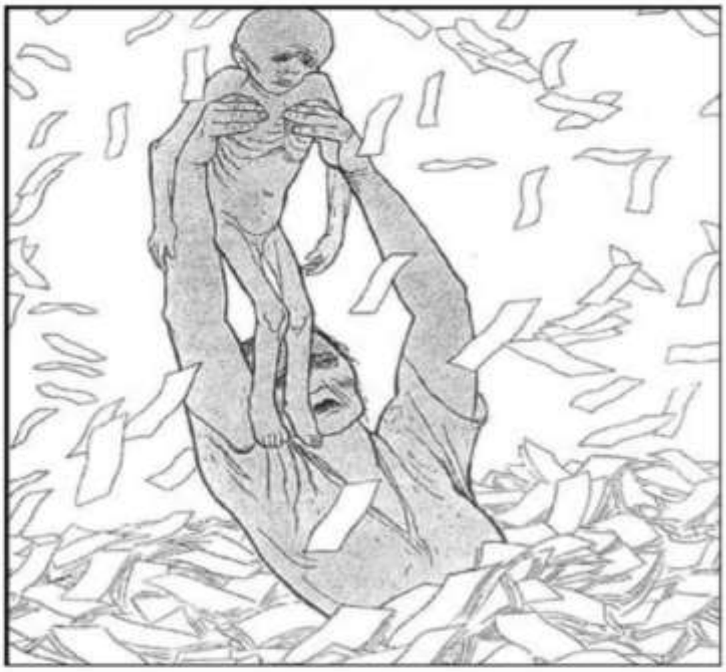
Rudolph Havenstein (1857-1923), President of the Reichsbank 1908-1923

The Reichsbank's mistake had been twofold: first to see the value of the mark as something fixed exogenously to the German economy; and second to believe that the external value of the mark determined the internal price level, which in turn determined the quantity of money. There was some truth to the idea that the exchange value of the mark was determined exogenously: events such as the terms of the Treaty of Versailles in 1919, the imposition of reparations in 1921, and the Ruhr occupation of 1923, did impact on the value of the mark and cause it to fall in currency markets. But they did not fundamentally determine the value of the mark, and the effects they had would have been temporary were they not compounded by the monetary situation within Germany. The basic cause of the depreciating mark was the excessive printing of marks. The value of the mark was a dependent variable: the greater the nominal level of monetary demand within Germany the higher was the level of imports – and so the greater the supply of marks on international markets and the lower the value of the currency. Further, as the supply of marks increased and their purchasing power declined, people sought to convert their marks into stable foreign currency, which again increased supply and pushed down the value of the mark. A country experiencing an inflationary monetary boom will tend to have a falling exchange rate. When Germany's internal price level stabilised so did its exchange rate. Second, while the Reichsbank was correct to see that a depreciation of the mark would raise the price of imported goods, this could only generate a sustained rise in the prices of all goods, services, and factors of production if the money supply rose to accommodate it – which is precisely what it did do. If the Reichsbank had not increased the money supply the inflation would have burned itself out: the prices of imported goods would have risen and demand for them would have fallen, with some shift to domestic goods whose prices would have risen somewhat and that would have been it. In practice the Reichsbank not only accommodated the initial rise in import prices, it anticipated and fuelled further inflation by printing even more money to cover an expected rise in the general level of prices. Thus, the Reichsbank not only brought about the inflation its own theory predicted, but in so doing it led to a further fall in the external value of the mark, so triggering a further wave of inflationary expectations and a further increase in the money supply and so on.

A Two Billion (Two Trillion in modern usage) Mark Note issued on 5 November 1923

Conclusion

Hyperinflation occurred in Germany because of a vast over-issue of the circulating medium. By November 1923 the German people were almost literally drowning in an ocean of worthless paper money – worthless because there was simply too much of it, far more than the economy could usefully use to either carry out transactions or store value. So in this sense it is easy to answer the question: why did hyperinflation occur in Germany? It happened because the Reichsbank printed so much paper money that its effectively became worthless. In November 1923 a single box of matches was worth the entire amount of marks existing in pre-war Germany.



A cartoon published in Germany in 1923. The mother is shouting, 'Bread! Bread!'

It should be emphasised that neither the Reichsbank nor the German government set out, knowingly, to do this. It was the unanticipated result of three main factors:

1. The inability of the Weimar government to cover its spending with the necessary levels of taxation. 'The crux of the matter', concludes Graham, 'was the state of the public finances.'[1] Government spending in the wake of war and revolution was high, but the government lacked the political authority or confidence to raise taxes sufficiently to cover that spending. Of course, for a government to spend more than it raises in taxes is not unusual, and many European governments emerged from the war with a fiscal deficit. But where other countries cut spending and raised taxes to close the deficits, Germany did not. Further, as the amount of debt it issued to fund this deficit increased, it was unable to attract sufficient funds from the private sector to cover it. As a result it had recourse to printing money through Reichsbank Treasury Bill purchases. This was the underlying driver of German inflation, and as the inflation accelerated and the efficiency of the state's tax raising system declined, more and more of the government's spending was being funded through printing money – which became, in effect, the default method of government taxation. The below table shows the value of Treasury Bills discounted by the Reichsbank each November for the years 1914 to 1923. It was in November 1923 that the process ended, when the government, in return for a loan of 1,200 of the new Rentenmarks, agreed to shop issuing Treasury Bills.

Table Eight. Total Value of Treasury Bills purchased by the Reichsbank each November, 1914-1923 (in billions of paper marks)

Date	**Total Value of Treasury Bills Discounted by the Reichsbank each November (Billions of paper marks)**
1914	2.9
1915	5.7
1916	12.6
1917	28.6
1918	55.2
1919	86.4
1920	152.8
1921	247.1
1922	1,495.2
1923	1.2 (Quintillion)

2. The Impact of Reparations. Reparations did not cause the German hyperinflation, but they did exacerbate it in several ways: the announcement of the initial reparations sum in May 1921 led to a run against the mark; the payment of reparations in 1921 caused an increase in the supply of marks relative to foreign currencies and the printing of money to raise the necessary supply of marks; the declaration by Germany in July 1922 that it could no longer afford to pay reparations prompting a further loss of confidence in the mark; and the Ruhr occupation by the French and Belgians to collect reparations in kind, which led to a further flight from the mark, balance of payments difficulties, and the far greater printing of money to pay for the passive resistance and make good the loss of tax revenues from the Ruhr. Reparations made the fiscal and monetary situation of the German government worse: but

[1] Graham, *Exchange, Prices, and Production in Hyperinflation* p. 76.

they did not create Germany's difficulties, and the negative impact of Reparations was largely due to the decisions taken by the Weimar government – to purchase the foreign currency by printing money rather than through taxation, to default on reparations in 1922, and to fund passive resistance in the Ruhr through printing money. Thus Graham, whilst recognising the role of Allied policy in helping to drive down the value of the mark in the years following the war and thus causing prices to rise, concludes that:

> Depreciation, as measured by internal prices rather than exchange rates, is ultimately dependent solely on note issues. The decision as to whether notes should be issued lay with the German administrations. The hard fact of external pressure was, in itself, enough to ruin the exchange value of the currency, though a more than Spartan tax policy might perhaps have preserved its internal value. The several administrations, however, though at times resolute, were fundamentally weak, and the interests on whom taxation must fall if it was to be productive were powerful enough to delay, or defeat, the passage of legislation. The slightest delay was fatal.[1]

3. The Depreciation Theory of Inflation. A striking feature of the inflationary debacle is the apparent fatalism with which German political and financial leaders allowed it to happen. One can understand why the new Weimar government, inexperienced in office, unwilling to raise taxes for the mass of the working class, and already despised by much of the established elites for their part in signing the Versailles Treaty, may have turned so willingly to the printing of money to pay their way. But why did senior banking figures go along with this method? Here the role of mentalities was crucial. Germany's economic and monetary thinkers rejected the apparent simplicity of the Quantity Theory of Money, coming to see prices as a reflection of the overall condition of the economy – rather as a doctor might view a patient's temperature as a symptom of underlying health issues. They attributed the inflation to a structural imbalance in the balance of payments and to the extreme (as they saw it) burden imposed in the form of reparations. In a way it suited all sides, Right and Left, to indulge this theory, for it meant that inflation was not something brought about by Germany's free agency, but rather was something imposed upon Germany by the Allies and the effects of the Treaty of Versailles and reparations. The best the monetary authorities could then do was to supply the ailing Germany economy with the cash it needed to sustain the burdens of the Versailles Treaty until the Allies saw sense to revise them. Unfortunately, this theory mis-diagnosed the cause of the inflation, which was due to German agency in printing money, and its treatment in the form of printing yet more money only made it worse, requiring larger and larger doses of cash until the theory could no longer keep contact with reality – when it collapsed.

Thus, the essential cause of the German inflation of the years 1918 to 1923 was the excessive issue of non-convertible paper money. But to understand *why* this happened, we need to refer to the government's problems and policies and the inverted theory of inflation which led the Reichsbank to do the one thing that would cause the inflation to accelerate: print money.

[1] *Ibid*., pp. 76-7.