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MONETARY OVERHANG AND REFORMS IN THE 1940s

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ABSTRACT

Monetary Overhang and Reforms in the 1940s*

The monetary overhang, pervasive with price controls and shortages in Eastern Europe and the Soviet Union, offers close parallels to the post-1945 picture of Europe. At that time monetary reform was used in many countries, in one form or another, to bring liquid assets in line with the prevailing level of prices. This paper reviews that experience and explores the lessons for today.

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Keywords: monetary reform, monetary overhang, reconstruction

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NON-TECHNICAL SUMMARY

'Soft measures don't create hard currencies.' W. Vocke, 1948

While the aftermath of World War I was characterized by 'open inflation', the post-World War II world of controlled prices, stagnant production and substantial idle money balances is strikingly reminiscent of Eastern Europe today. Monetary reform rather than hyperinflation was the rule. Only Italy and France allowed open inflation; most of Europe opted for monetary reform at the going level of prices. The paper reviews the conceptual issues involved in monetary reforms and discusses the historical evidence, including the German reform of 1948.

Macroeconomics becomes harder as political repression becomes less effective. The experience of Latin America suggests that in economies with large public sectors, politicized wage-setting, a printing press and new democracy, macroeconomic instability is endemic. The crumbling of the Eastern European regimes raises the spectre of a repeat performance. Initial results from Poland and Yugoslavia are not encouraging, with Bulgaria, at the time of writing, appearing poised to follow her neighbours into hyperinflation. Their example may yet be dwarfed by the Soviet Union. The overhang built up over half a decade of monetary expansion is beginning to slide. The statistics are, of course, wide open to question, but an indication of the problem ahead is given by the behaviour of the budget.

Table 1: The Soviet Budget Deficit

(Percent of GNP)

	1985	1987	1988	1989
Revenues	48.0	45.9	43.3	43.2
Spending	49.7	52.2	52.5	53.1
Budget Deficit	1.7	6.3	9.2	9.9

Source: E Gaidar, 'Financial Crisis and Political Problems of Economic Stabilization in the USSR'

As market forces are unleashed and controls lifted, the removal of the monetary overhang becomes crucial. Monetary adjustment can be accomplished in two ways: either by a big, possibly one-shot inflation, or by a reduction of effective nominal money balances. Money balances can be either written off, consolidated as debt or retired by asset exchanges or budget surpluses. Of course, monetary reform is not enough; it attends at best to the *stock* issue, the monetary overhang, but it does not solve the *flow* problem, which is the budget deficit. The flow problem calls for the conventional budget-cutting in the form of elimination of

subsidies, reduction of public programmes and improvements in tax administration.

We distinguish three basic types of monetary reform: The first is a mere change of numeraire. In this reform a new currency is issued with full unimpaired conversion of the old currency into the new one. The purpose of the conversion would be to eliminate a number of zeros. It might also help determine the wealth distribution with a view towards later taxation or to eliminate illegally acquired currency hoards.

The second kind of reform immobilizes money holding for a specified or unknown period by blocking bank accounts. The measure is in essence temporary; either the assets are subsequently unfrozen or else the measure ends in a later write-off of the frozen assets or a (forced) conversion into interest-bearing, non-marketable loans. In the latter case an upper bound on the converted assets might be set with regard to political objectives. Being forced, the interest rate on the conversion, would be at the discretion of the government, thus avoiding the difficulty that arises in a voluntary conversion, where lack of credibility translates into potentially extravagant interest rate burdens.

Decisions about write-offs have to be considered in the context of the balance sheets of financial institutions. If the assets are non-performing, because of physical destruction of collateral, loss of territory or otherwise, there is simply no reasonable way of sustaining the liabilities. Of course, the government could guarantee the liabilities and place in bank balance sheets net-worth certificates serviced out of general revenues, but this would evidently place an extravagant burden on public finance.

This is one respect in which the Soviet Union and Eastern Europe today offer a special opportunity. Unlike in the case of Europe in the immediate aftermath of the war, in these countries the physical capital stock, while in a sad state, is still in existence and is in the hands of the government, as is the banking system. There is a possibility, therefore, of combining cancellation of interfirm debts, privatization of assets and monetary reform.

The third kind of monetary reform is confiscatory: currency and/or bank accounts are written off on an across-the-board conversion rate or on a differentiated basis. Here the conversion is not merely nominal but real: money balances are converted at a less favourable rate than flows such as rents or wages. A uniform conversion of all nominal assets held by the public is equivalent to a blip in the price level and thus has the same distribution effects. A more differentiated process can accommodate desired political features such as the special taxation of speculators (which hold currency) or of affluent groups (which hold government debt and large deposits).

In the 1940s and 1950s most monetary reforms differentiated according to type and magnitude of asset holdings in respect to the write-off ratio. The differentiation recognized the political objective of targeting groups that had gained, illegally or as a matter of fact, in the war period, or simply reflected the desire to share burdens on the basis of the ability to pay. An investigation of the distribution of monetary assets, therefore, was always an important consideration in designing monetary reform. The accompanying table shows a summary of the measures taken in various countries.

Table 2: Monetary Reforms in the 1940s and 1950s

Country	Date	Conversion	Blocking Forced Loan	Capital Levy
No monetary reform				
Italy				
United Kingdom				
Nominal Monetary Reform				
None				
Confiscatory Reform				
Austria I	Jul. 1945		*	
Austria II	Nov. 1945		*	
Austria III	Nov. 1947	*		
Belgium	Oct. 1944		*	*
Bulgaria I	Mar. 1947		*	*
Bulgaria II	May. 1952	*		
Czechosl. I	Oct. 1945		*	*
Czechosl. II	Jun. 1953	*		
Denmark	Jul. 1945		*	*
Finland	Dec. 1945		*	*
France I	Jun. 1945		?	
France II	Jan. 1948		*	*
Germany (East)	Jun. 1948	*	*	
Germany (West)	Jun. 1948	*	*	
Hungary I	Dec. 1945	*	*	
Netherlands	Sep. 1945			*
Norway	Sep. 1945			*
Poland I	Dec. 1944			*
Poland II	Oct. 1950	*		
Romania I	Aug. 1947	*	*	
Romania II	Jan. 1952	*		
Yugoslavia	Apr. 1945	*	*	*
Hyperinflation Stabilization				
Greece	Nov. 1944			
Hungary II	Aug. 1946			

"Ich glaube, wenn Sie eine wirkungsvolle
Wahrungsreform machen, werden Sie
erstaunt sein, was die Zukunft bringt."
Lt. E.A. Tenenbaum, 1948

"Soft measures don't create hard currencies."
W.Vocke, 1948

Macroeconomics becomes harder as political repression becomes less effective. The experience of Latin America suggests that in economies with large public sectors, politicized wage setting, a printing press and new democracy macroeconomic instability is endemic.

The crumbling of the Eastern European regimes raises the specter of a repeat performance. At a time when extensive monetary overhangs, built up through a decade of deficit monetization with controlled prices and rationed goods, are already threatening an inflationary outburst, the newly elected democratic governments find themselves pressurized to deliver on the promises of free market economics. In the (likely) absence of rapid real productivity gains, the printing press may yet again emerge as a convenient, if temporary, tranquilizer. Initial results from Poland and Yugoslavia are not encouraging, with Bulgaria, at the time of writing, appearing poised to follow her neighbors into hyperinflation.

Their example may yet be dwarfed by the Soviet Union. The overhang built up over half a decade of monetary expansion is beginning to slide: shortages are pervasive and black markets increasingly spring up to satisfy the

demands remaining unfulfilled on the official market.The statistics are, of course, wide open to question, but an indication of the problem ahead is given by the behavior of saving deposits relative to the money incomes of the population :

Table 1 Soviet Union: Inverse Velocity
Saving Deposits Relative to Money Income (Index 1980=100)

1980	1985	1989
100	117	134

Source: UN Economic Survey of Europe 1989-90.

As we argue below, the significant fall in velocity is typical as a prelude to a major monetary problem.

Table 2 The Soviet Budget Deficit
(Percent of GNP)

	1985	1987	1988	1989
Revenues	48.0	45.9	43.3	43.2
Spending	49.7	52.2	52.5	53.1
Budget Deficit	1.7	6.3	9.2	9.9

Source: E. Gaidar "Financial Crisis and Political Problems of Economic Stabilization in the USSR"

No relief is to be found on the budget side: the data show persistent and increasing deficits. As comprehensive price controls remain in effect and output is, at best, stagnant, the monetized part of the deficit adds directly to the overhang.

As market forces are unleashed and controls are lifted, the removal of the monetary overhang becomes crucial. Just as in Latin America, in the Soviet Union the answer to stabilization is "impossible- nievazmozhno". But

in the end, of course, stabilization will come, although that may only be in the wake of hyperinflation rather than as a deliberate reduction of the money stock.

Monetary reform can be accomplished in two ways: Either by a big, possibly one-shot inflation, or else by a reduction of effective nominal money balances[2]. Money balances can be either written off, consolidated as debt or retired by asset exchanges or budget surpluses.

On quantity-theoretic grounds, the alternatives of increasing the price level or reducing the money supply are equivalent. Both succeed by lowering the real money supply to its equilibrium level. As we will illustrate below, the short run consequences may however differ substantially. Of course, monetary reform is not enough; it attends at best to the stock issue, the monetary overhang, but it does not solve the flow problem, which is the budget deficit. The flow problem calls for the conventional budget cutting in the form of elimination of subsidies, reduction of public programs and improvements in tax administration.

To date, the favored official view in Eastern Europe has placed the burden of adjustment squarely on the price level: the problem, on a fundamental level, is the artificially high price of money in terms of goods. A one time increase in the price level can restore equilibrium in both the goods and the money market.

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[2]Effective money refers to those money balances which are immediately available for transaction purposes. Total money is obtained by adding blocked or otherwise incapacitated balances

While the experience of Poland and Yugoslavia cautions against uncontrolled reliance on the price mechanism, the assessment of the alternative path requires more empirical background[3].

The European experience in the decade following World War II provides a fertile testing ground for this purpose. While the aftermath of World War I was characterized by "open inflation", the post World War II world of controlled prices, stagnant production and substantial idle money balances is strikingly reminiscent of the Eastern Europe of today.[4]

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[3] See Wolf (1990) for a preliminary assessment of the June 1990 monetary reform in the German Democratic Republic.

[4] See Dornbusch and Fischer (1986) and Dornbusch, Sturzenegger and Wolf (1990) for the experience following World War I.

Table 3 Post War Price Movements : 1918-1922 and 1945-1949

	1918	1920	1922	1945	1947	1949
	(WPI 1914=100)			(CPI 1937=100)		
Austria				127	316	695
Belgium			307		339	372
Czechoslovakia			1318	188	326	
Denmark	217	278	132	162	166	170
Finland	550	1120	1150	292	606	854
France	329	488	317	436	1207	2200
Italy	425	610	560		4575	4886
Netherlands	262	245	150	176	199	216
Norway	330	371	226	160	165	164
Poland				7597	12134	12970
Spain	206	223	174	275	424	489
Sweden	336	355	172	145	150	161
Switzerland			166	153	159	162

Annual averages except 1949 (latest available)
Source : Wirtschaftsjahrbuch 1950, Mitchell(1978)

In the following sections, we review the conceptual issues involved in monetary reforms and discuss the historical evidence, placing particular weight on the German reform of 1948.

I. THE BUILDUP OF A MONETARY OVERHANG : 1940-1945

The requirements of rearmaments and provisions markedly increased the outlays of the typical European country during the war. As governments were reluctant to rely on extra taxation for reasons of morale, and debt sales, though generally successful, were rarely sufficient to cover the increased expenditure, unfunded deficits became the rule rather then the exception. As a common practice, governments relaxed regulations regarding the permissible

degree of monetization for the duration of the military conflict, leading to substantial increases in the supply of money. In countries under occupation, further increases in the money supply resulted from the attempt of the occupying forces to extract support from the local economy.[5]

Table 4 Increase in Money Supply during German Occupation

Belgium	264 %	Norway	481 %
Denmark	238 %	Yugoslavia	1533 %
Netherlands	317 %		

Source : Klopstock (1946)

More or less extensive price controls were introduced to facilitate the military planning process and to avoid the demoralizing consequences of the threatening rapid inflation. In combination with the rationing of scarce consumption goods as resources were shifted towards the military sector, the measures resulted in a substantial buildup of forced savings.

At the end of the war, these accumulated funds, representing for the most part involuntarily postponed consumption rather then desired long term savings, confronted a supply of consumption goods which remained at a low level due to war destruction and the difficulty of converting factories back to the production of civilian goods. While governments continued to rely on price controls and rationing, these measures, willingly endured during the war, became increasingly unpopular.[6]

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5 See Delvianis and Cleveland (1949) for an extensive description of the Greek case.

6 Tables A3-1, A3-4, A3-5 and A3-6 in the appendix provide detailed data on nominal money, prices, income and industrial production in 1945 as a proportion of the pre-war level for most European countries.

With the end of hostilities, countries who were liberated and those who were occupied thus faced much the same issue: how to return to financial stability and how to restore a functioning economy. Restoration of a functioning monetary system was an essential step on the road to recovery.

II DEALING WITH THE OVERHANG: OPTIONS

The essential characteristic of a monetary overhang is the freezing of an important segment of prices at disequilibrium levels, given the money stock and the level of output.

Consider as a guide the quantity equation :

(1) $V = PY/M$

During the war, the typical European country experienced a loss in (consumption) output, a substantial increase in money supply as a consequence of deficit monetization and a fairly constant price level due to more or less extensive controls. As a result, actual velocity declined substantially. As a first approximation we take desired velocity as a constant[7]. Seen in this light, the monetary overhang is reflected in a fall of actual relative to desired velocity. The resulting disequilibrium can be characterized equivalently as an excess supply of real money or an excess demand for commodities.

Four basic mechanisms exist to restore equilibrium in both markets:

- An increase in the level of output, at the prevailing level of

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[7] See below for a more detailed discussion of this point.

prices (but with an adjustment in relative prices, if necessary). However, the question arises whether output can rise sufficiently within a relatively short period to eliminate an overhang of non-trivial magnitude. Further, the experience of the 1940s as well as the recent developments in Eastern Europe suggest that monetary reform may be a precondition for the recovery of output[8].

- A decrease in desired velocity, at given prices, money and output. The question arises whether demand for long term saving accounts is sufficiently elastic with respect to the available policy instruments, in particular the interest rate, to make this channel feasible for any but the smallest disequilibria.

- A rise in the price level, by fiat or by market forces.

The remaining alternative is a reduction of the effective money supply. This could take two forms:

- A blocking of nominal assets that immobilizes a portion of the monetary holdings.

- A uniform or differentiated write-down or conversion of monetary assets (or of all nominal assets) held by the public.

In the end, neither of the "easy options" of an increase in output or a substantial fall in desired velocity is likely to cure but the mildest case of monetary overhang. The realistic choice faced by governments comes down

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8 We will return to this point below in assessing the effect of monetary reform on subsequent real performance.See also Wolf(1990)

to accepting a period, however brief, of rapid inflation or to a reduction in the effective money supply. We now consider both options in turn.

III. ALTERNATIVE MONETARY REFORMS

We can distinguish three basic types of monetary reform: The first is a mere change of numeraire. In this reform a new currency is issued with full and unimpaired conversion of the old currency into the new one. The purpose of the conversion would be either to eliminate a number of zeros.[9] It might also help determine the wealth distribution with a view towards later taxation or to eliminate illegally acquired currency hoards.[10]

The second kind of reform immobilizes money holdings for a specified or for an unknown period by blocking bank accounts. The measure is in essence temporary; either the assets are subsequently unfrozen or else the measure ends in a later write-off of the frozen assets or a (forced) conversion into interest bearing non-marketable loans. In the latter case an upper bound on the converted assets might be set with regard to political objectives. Being forced, the interest rate on the conversion would be at the discretion of the government, thus avoiding the difficulty that arises in a voluntary

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[9] This is clear because the new monetary unit applies to all nominal stocks and flows, i.e. it extends to currency, accounts, debt, wages and prices.

[10] This first of these motives figures prominently in the Argentinean and Brazilian reform cycles. The second was of considerable importance in the post WWII reforms, notably so in the Scandinavian countries. The third motive played a subsidiary role in virtually all post WWII monetary reforms, regardless of the type. In the 1948 reform in Germany, for example, the conversion of deposits above 5000 RM required prior authorization from the fiscal authorities.

conversion where lack of credibility translates into potentially extravagant interest rate burdens.

A number of factors bear on the prospects of this approach: The government may not have the fiscal capacity to service the debt. This is particularly true in the aftermath of a war where tax yields may be small and reconstruction spending is large. A write-off of nominal assets in such a situation may clear the ground for the issue of a public debt whereas respect of old money and debts would simply overburden public finance and thus the credibility of further debt finance.

Decisions about write-offs have to be considered in the context of the balance sheets of financial institutions. If the assets are non-performing, because of physical destruction of collateral, loss of territory or otherwise, there is simply no reasonable way of sustaining the liabilities. Of course, the government could guarantee the liabilities and place net worth certificates serviced out of general revenues in bank balance sheets, but this would evidently place an extravagant burden on public finance.[11]

This is one respect in which the Soviet Union and Eastern Europe today offer a special opportunity. Unlike in the case of Europe in the immediate aftermath of the war, in these countries the physical capital stock, while in a sad state, is still in existence and is in the hands of the government as is the banking system. There is a possibility therefore of combining

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[11] On a much more limited scale, this approach was followed in Germany to maintain the solvency of the commercial banking sector.

cancellation of inter-firm debts, privatization of assets and monetary reform.[12]

The third kind of monetary reform is confiscatory: currency and/or bank accounts are written off on an across-the-board conversion rate or on a differentiated basis. Here the conversion is not merely nominal but real: money balances are converted at a less favorable rate than flows such as rents or wages. A uniform conversion of all nominal assets held by the public is equivalent to a blip in the price level and thus has the same distribution effects. A more differentiated process can accommodate desired political features such as the special taxation of speculators (who hold currency) or of affluent groups (who hold government debt and large deposits).

The choice between blocking and conversion is determined by a number of considerations :

- To achieve the same effect on consumption, ceteris paribus, the blocking ratio must exceed the conversion ratio. The monetary overhang corresponds to excess savings on the part of consumers. Once quantity controls are lifted, the demand for consumption goods derives from a flow component representing the flow income accruing to consumers and a stock component reflecting the desire of asset holders to exchange part of their monetary wealth for goods. As the flow income bears a rough relationship with the flow of newly produced goods, it is the stock adjustment that gives rise to the inflationary pressure.

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12 Recommended for the Soviet Union by Feldstein (1989).

Conversion , i.e. wealth taxation, is effective by reducing consumer's asset holdings to the desired level, given current prices and income flows. Blocking, on the other hand, operates by limiting the extent to which the desired substitution from monetary wealth to commodities can take place.The two strategies differ in the marginal propensity to consume out of an equal amount of unrestricted asset holdings: at least a certain proportion of the blocked assets continues to be treated as real wealth which will become available at some time in the future. In consequence, the propensity to consume out of the free accounts will be higher in the case of blocking then in the case of conversion.

Blocking assets in preference to outright conversion preserves the option of releasing funds, without inflationary consequences, if economic conditions are revealed to be better then anticipated. Thus blocking at best replaces, at worst postpones the politically unpopular wealth tax.[13]

• Conversion places holders of monetary wealth at a disadvantage vis a vis holders of real assets. The resulting political conflict has often been addressed by subsequent real wealth levies aimed at the equalization of of the burden of reform.

• Monetary reform has a special significance if it risks impairing the assets of potential buyers of state enterprises. One view in the debate holds that write-offs impair the growth prospects of the emerging market

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[13] It is interesting to note in this context that almost all of the countries finally opting for a conversion did not have a democratically elected government at the time of monetary reform. In contrast, most democracies opted for blocking in preference to conversion.

economy: if large deposits are written off, their holders, who are the most likely candidates to run capitalism, would as a result be unable to participate in a buy-out of the public sector firms. Of course, this argument places much weight on the initial distribution of assets as indicating capitalistic ability and it implicitly assumes that buy-out rather than give-away is the best means of privatization.

IV. MONETARY REFORMS : THE SIZE OF THE OVERHANG

Monetary reform aims to reduce the effective money supply to a level consistent with price stability, either by blocking the excess monetary holdings or by conversion. While the pervasiveness of queues or the difficulties of rationing may give an impression of repressed inflation, a precise estimate of the extent of the overhang is necessary to achieve this objective.

One approach to monetary reform would be to look back to a previous period of relative economic stability, calculate the change in nominal income that occurred since that time and assume the old level of velocity as the plausible level in a situation of decontrol. That affords an estimate of the percentage overhang: To move the current level of transactions at the old level of velocity requires a money stock $M' = PY/Vo$. Accordingly the percentage overhang is:

$$\lambda = M/(Y/Vo)$$

But this expression may be quite misleading for a number of reasons: If monetary reform is accompanied by a decontrol of prices then there is a

possibility that output could rise significantly. The increase in output would result from more productive use of resources in response to an alignment of relative prices and from a greater supply of labor effort. Increased output, as already noted, reduces the overhang.[14]

Moreover, in a situation of repressed inflation there will be black markets. Prices in the black market will be part of the "effective" price level prior to monetary reform and the output traded in the black market must be included in the volume of transactions in addition to the controlled value of output:

$$MV = P_b Y_b + P_c Y_c$$

Accordingly the quantity equation must be modified to allow for the possibility that the price level need not rise. Black market prices might fall (certainly relatively)[15] and thus offset to some extent the rise in controlled prices. There is no simple answer and the actual behavior of velocities bears this out.

Table 5 Velocity Movements Pre and Post-Reform

Belgium		Czechoslovakia		Netherlands		Germany (West)	
1937	1.52	1937	0.74	1937	1.98	1937	3.73
1944a	0.55	1945a	0.32	1945a	0.38	1948a	0.18
1944b	1.58	1945b	9.44	1945b	1.01	1948b	21.29
1949	1.59	1949	1.83	1949	1.95	1949	4.22
Post/37	1.04		12.75		0.51		5.71

Source : Pesek (1958)

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[14] There are also once and for all effects: a reduced hoarding demand for scarce goods and a sell-off from inventories by firms who have held goods as a speculative asset. Of course, these are not recurrent and hence cannot affect the long run price level.

[15] We will present evidence on this point below in the discussion of the German reform.

The right conceptual approach to start is a non-market-clearing model of the economy such as Barro and Grossman (1976). It is well-known that there are no simple answers. Complications include the effect of rationing on labor supply, the diversion of resources to the black market and the effects on labor supply and on spending of anticipated changes in the rationing scheme over time. The particular specification of tastes and technology will shape the results.

The expectation of an (eventually unavoidable) monetary reform might reduce the demand for real balances as money holders shift into black market goods, financial assets[16] or dollars[17], thereby increasing the monetary overhang. But the effect is not altogether clear-cut: black market prices for dollars might already reflect a significant premium and securities would be risky because of the possibility of capital levies.

Some evidence on the anticipation of monetary reform in Germany, for example, is available. The exchange rate of the Swiss Franc (SF/100 RM) moved from 1.62 to 1.9 in the period January to May 1948 before declining to 1.25 in the final month before the reform. Interestingly, the rise falls far short of the actual write-off on German monetary assets.

Also, in a situation of shortages the public might wish to hold unusually large balances to take advantage of opportunities to purchase goods, should

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16 The German stock market, to take an example, experienced a substantial boom during the "dismal years" 1945-1948.

17 Once the likelihood of reform becomes a certainty, the flight into real assets becomes intensified. In the last week beform the German currency reform, the black market prices for cigarettes increased tenfold from 5 to 50RM, the dollar traded for up to 1000 Mark, (Neue Zurcher, 21.6.1948).

they be found accidentally. Thus there is a "precautionary" demand that is artificially enlarged by the disruption of markets. It seems, however, that in the face of the possibility of monetary reform and major write-offs this precautionary demand was met by cigarettes rather than money.[18]

The upshot of this discussion is that there is no clear-cut way to judge what would be the write-off in nominal money balances that maintains the initial level of controlled prices as the equilibrium level. The questions arises as to the relative merits of a "soft" versus a "hard" reform. If the write-off is insufficient it is clear that there will be inflation or continued control with the prospect of a further write-off in the future which in turn aggravates distortions[19]. Alternatively, if the write-off errs on the side of being more substantial then necessary there is room for the government to gain from the seigniorage receipts of the one-time money issue. An over squeeze might also be motivated by a desire to leave firms highly illiquid so that they would be forced to sell off inventories, thereby increasing the current effective supply of goods.[20]

Conversion and blocking are of course not mutually exclusive. Given a guesstimate of the size of the overhang and of the likely recovery of output, the combination of a generous conversion rate with a substantial blocking permits the government to adopt a wait and see attitude: If the

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[18] See Guggenheim (1965), Schmolders (undated) and Wirtschaftsspiegel (1948).

[19] If the monetary reform includes the introduction of a new currency, a (perceived) insufficiency of the initial measures may also adversely affect the public acceptance of the new money.

[20] This argument was used in the German reform of 1948 to limit the initial cash allocations to firms

initial guesses turn out to be correct ex post, the blocked funds can be released and the original generous conversion rate maintains. If events take a less positive turn, a conversion of the blocked assets lowers the original conversion rate to a level more consistent with price level stability. As we will see below, the latter procedure was successfully adopted in the German monetary reform.

V. INFLATION[21]

The only feasible alternative to reducing the nominal money supply is an increase in the price level. From a classical point of view, both policies are equivalent: whether the excess supply of real money balances is cured by a decrease in nominal money or a one time increase in the price level is irrelevant.

In practice, the typical economies with monetary overhang face a dual problem. On the one hand, equilibrium on the money market requires an adjustment of the absolute price level. On the other hand, an alteration in the typically distorted relative price structure is necessary to restore goods market equilibrium. In the presence of long term staggered contracts, partial indexation and implicit agreements, adjustment will not come as a

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[21] On the dynamics of inflation J.W. Goethe noted: "Die Geister die ich rief, werd ich nun nicht mehr los".

blip in the price level but as a more or less protracted period of high inflation.[22]

High inflation in turn, may feed upon itself. Two effects are of particular importance:[23] Inflation tends to reduce the real value of taxes.In the absence of additional revenue sources, the solution of the stock problem may thus give rise to a flow problem as the increased deficit is monetized. Furthermore, as inflation accelerates economic institutions adjust to the new environment. In financial markets, the introduction of indexed assets combined with the gradual replacement of currency as viable medium of exchange further increases desired velocity. In the goods and factor markets, payment arrangements shift towards more frequent adjustment, enhancing the economy's sensitivity to future inflationary shocks.

While the importance of these factors will of course vary across economies, the potential for economic catastrophe cannot be denied: Of the countries which have opted for the inflationary solution in preference to a reduction in effective money, four[24] have experienced hyperinflation, with Hungary and Greece leading the all-time hit list.

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[22] From a policy point of view a number of steps, in particular an adjustment of the relative price structure by decree prior to the unfreezing of prices and a mandatory renegotiation on long term contracts at the time of the reform, can be undertaken to reduce if not eliminate the importance of factors leading to protracted inflation.

[23] See Dornbusch, Sturzenegger and Wolf (1990) for a detailed descripton of these feedback channels.

[24] Hungary(1946), Greece(1944/46), Poland(1990) and Yugoslavia(1990).

VI HISTORICAL EVIDENCE 1945-1952

At the end of World War II most European countries, with the important exceptions of Italy and the UK applied a reform of one of the types described above. Table 5 provides a summary overview of the reforms.[25]

While the German monetary reform of 1948 is perhaps the best known example (just as the 1923 hyperinflation and stabilization), it is clear that Germany's reform offered nothing special. Its prominence is perhaps due to the accompanying tax and market liberalization measures that were important ingredients for the "economic miracle" that followed after 1948, a point to which we will return below.

The Table also illustrates the predominant choice of a reduction in effective money in preference to the inflationary solution to the monetary overhang.[26]

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[25] Details are provided in the appendix. We also refer to the various references that discuss the specifics of each reform. We note in particular that monetary reform goes beyond conversions of notes and deposits since it must deal with a wide variety of debts, including for example, public debt, insurance, rent contracts, etc.

[26] We restrict our attention to Europe. Japan, for example, opted for a combination of conversion and blocking.

Table 6 Monetary Reforms in the 1940s and 1950s

Country	Date	Conversion	Blocking or Forced Loan	Capital Levy
NO MONETARY REFORM				
Italy				
UK				
NOMINAL MONETARY REFORM				
None				
CONFISCATORY REFORM				
Austria I	Jul. 1945		*	
Austria II	Nov. 1945		*	
Austria III	Nov. 1947	*		
Belgium	Oct. 1944		*	*
Bulgaria I	Mar. 1947		*	*
Bulgaria II	May 1952	*		
Czechosl'a I	Oct. 1945		*	*
Czechosl'a II	Jun. 1953	*		
Denmark	Jul. 1945		*	*
Finland	Dec. 1945		*	*
France I	Jun. 1945		?	
France II	Jan. 1948		*	*
Germany (East)	Jun. 1948	*	*	
Germany (West)	June 1948	*	*	
Hungary I	Dec. 1945	*	*	
Netherlands	Sep. 1945			*
Norway	Sep. 1945			*
Poland I	Dec. 1944			*
Poland II	Oct. 1950	*		
Rumania I	Aug. 1947	*	*	
Rumania II	Jan. 1952	*		
Yugoslavia	Apr. 1945	*	*	*
Hyperinflation Stabilization				
Greece	Nov. 1944			
Hungary II	Aug. 1946			

Sources: Gurley (1953), Klopstock (1946), Pesek(1958), Ames (1954), Patat and Lutfalla (1986).

Most monetary reforms differentiated according to type and magnitude of asset holdings in respect to the write-off ratio. The differentiation recognized the political objective of targeting groups that had gained,

illegally or as a matter of fact, in the war period, or simply reflected the desire to share burdens on the basis of the ability to pay. An investigation of the distribution of monetary assets therefore was always an important aspect in designing monetary reform.[27]

VII MONETARY REFORM IN GERMANY

The currency reform in the Tri-Zone of June, 20 , 1948 marked the beginning of what has become known as the " German Economic Miracle". In the five months directly following the reform, industrial output increased by more then fifty percent, a ravaged, apparently moribund economy regained its health overnight. Furthermore, the strong growth performance was not restricted to an initial rebounding but continued well into the 1950s:

Table 7 Germany: Industrial Production

Year	Index	Growth Rate (%)
1946	34	
1947	39	14.7
1948	60	53.8
1949	90	50.0
1950	100	11.1
1951	123	23.0
1952	142	15.4
1953	160	12.6
1954	176	10.0
1955	190	7.9

Source : Grotius(1949) , Mitchell (1975)

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[27] In West-Germany, for example, the Colm-Dodge-Goldsmith report included as assessment of asset distribution. See Moller (1961).

The timing coincidence of currency reform and economic "takeoff" raises the issue of the role of the 1948 monetary reform in the "economic miracle". In the following section we provide a brief discussion of the West German case, both as an illustrative example of the buildup and eventual elimination of a monetary overhang and as a case study of the relation between monetary reform and real performance.

Background:[28] Fiscal and monetary policy in the Third Reich were completely subjugated to the war effort, the "noiseless financing" of the rearmament process being the proclaimed objective of the government. A resolution of the resulting inequities and inefficiencies was to await the end of military conflict. The shift of resources from the civilian to the military sector resulted in increasing shortages of consumption goods. Coupled with continued high employment and slightly increasing nominal wages, upward pressure on prices emerged as early as 1935/36. Regarding inflation as detrimental to morale, the government introduced a virtually complete price freeze in 1936, followed by a wage freeze in 1938.

As the war progressed, consumption was increasingly limited to the rationed quantities of necessities being made available at the controlled prices. The difference between the fixed nominal incomes and the consumption expenditures were accumulated as "forced savings". Lacking alternatives, these funds found their way to the commercial banks who in turn invested them in public debt instruments, allowing the government to cover part of

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[28] For a more detailed description, see Lutz (1949), Hielscher (1949), Moller (1961), and the references given therein.

its substantial primary deficit. The larger part of the deficit was however financed by money creation, as Table 8 illustrates. Debt and deficits grew year after year.

Table 8 Fiscal Situation in Germany 1937/45

	36/39	39/42	42/45
Expenditure	67.7	232.0	452.9
of which military	32.4	166.0	343.2
Receipts	64.9	172.1	277.5
of which borrowing	12.8	48.0	71.4
Deficit	2.8	59.9	175.4
Cumulated Deficit	5.1	64.9	240.3
Debt	30.7	137.7	379.8

[a]Excludes non-recognized debt (2.0 bn in 44/45) and Mefo Bills (8.1bn in 44/45)
Source : Veit(1961), Statistisches Handbuch von Deutschland 1928-1944

As the Third Reich dissolved, a major portion of the commercial bank assets became non-performing. While insolvent, banks remained liquid.[29] Effective consumption continued to be limited to the rations available at controlled prices. Lacking alternatives, the public continued to hold their idle balances in deposits.

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[29] Repayment of liabilities remained one of the few options available to holders of RM balances. As the eventual conversion of these holdings became more likely, the private sector used idle holdings to reduce outstanding debt. As a result, the claims of the commercial banking sector on the private sector declined significantly.

In the face of increasing supply shortages the military governments decided to maintain price and wage controls in place. However, the Allies failed to elicit private sector supplies as sellers refused to part with their goods in exchange for RM at the controlled prices. Rather, exchange activity took increasingly place on black markets at prices frequently exceeding official prices by a factor of 100 and more. Similarly, firms resorted increasingly to barter in preference to monetary exchange.

The combination of the wage freeze and the absence of consumption goods at controlled prices made leisure and black market activity an increasingly popular alternative to paid work.[30] In order to attract workers, firms increasingly shifted to payment in kind.

As the belief in an eventual substantial cut in RM holdings became widespread,[31] the proportion of transactions undertaken in Reichsmark dropped precipitously, in the end being limited to the purchase of rationed goods and the repayment of debt.In effect, the cigarette replaced the RM as medium of exchange as well as store of value.[32] By early 1948, the RM had ceased to function effectively as medium of exchange. The few exchanges still taking place against RM commanded increasing premiums.

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[30] in 1947/48, the average hourly wage amounted to 0.95 RM. At the same time, a single cigarette traded for 7 RM, a kilogram of butter for 900 RM on the black market.

[31] See, for example, Neue Zurcher, 21.6.1948.

[32] See Neue Zurcher, 21.6.1948 and Schmolders (undated)

Table 9 Official and Black Market Prices: Germany 1948
(Ratio)

	15.5.	19.6	30.6	15.7	15.8	15.9	15.10
Rye Bread	27.1	45.7	3.2	2.9	2.8	2.2	2.5
White Sugar	33.9	135.5	5.1	4.6	4.2	4.4	4.7
Butter	133.3	195.3	4.3	4.6	4.4	4.6	5.8
Cigarettes							
American	20.0	133.3	1.0	1.3	1.3	1.3	1.3
German	12.5	93.8	1.3	1.3	1.3	1.1	1.8

Source : Mendershausen (1949)

On the real side, the breakdown of the monetary system affected production more severely then consumption. Black markets in the few staple foods became widespread and increasingly tolerated by the military authorities. A fairly efficient exchange system based on American cigarettes replaced the monetary exchange based on RM. The diversified needs on the production side were less easily amendable to alternative exchange systems. While substantial barter trade developed[33], the necessity to establish a multiple coincidence of wants hampered production. As a consequence, industrial output, after an initial rebound from the minimal levels reached in the final months of the war, essentially flattened out in mid 1947 at roughly 50% of the pre-war level.[34]

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[33] See, for an impression, the advertisements in the contemporaneous business magazines.

[34] The statistics are based on reported output, placing a fairly large weight on the production of large enterprises. It is likely that some unreported production "for the shelves" in anticipation of a future return to normal monetary circumstances has taken place. Abelshauser (1975,1977) argues on the basis of energy consumption statistics that output in fact continued to increase throughout 1947. See however Buchheim(1989) and Ritschl(1985) for a critical assessment of the revisionist view.

Reform and Aftermath: The dismal economic situation, in conjunction with the developing strains between the Soviet Union and the Western Allies prompted the Bizone military government to drop its previous insistence on all German monetary reform and to develop plans for a currency reform in the western zones, which was implemented in June, 1948. The main provisions of the reform are given in Table 10.

Table 10 : Main Provisions of the West-German Currency Reform

[1] Individual holdings of RM , currency and deposits , were converted into DM at a rate of 100RM : 6.5 DM.
[2] To bridge the time until the conversion could be enacted, an allotment of 60 DM per capita and an equal amount per employee was used to inject initial liquidity into the system. Public sector authorities were provided with initial funds on the basis of their past cash flow.
[3] With few exceptions, all flow magnitudes , in particular wages, were converted at 1:1.
[4] In contrast to holdings of the private sector, intra-bank RM claims, RM claims against the Third Reich (including debt) and RM holdings of the public sector were canceled.
[5] Commercial Banks were granted claims against the Lander, accepted at the Bank Deutscher Lander, to cover the shortfall of assets relative to liabilities due to the cancellation of government debt.
[6] The Deutsche Mark was declared sole legal tender. The Bank Deutscher Lander, acting as central bank, was entitled to impose minimum reserve requirements. The total note issue was limited, the limit could only be raised with the consent of a qualified majority of the Lander.
[7] The budget was to be balanced.

A critical measure accompanying monetary reform was the substantial dismantling of controls. With the exception of controls and rationing for some basic materials and food, and of substantially all foreign transactions, prices were freed. Table 9 above shows the decline even in black market price ratios for goods that continued to be controlled.

Just as the Rentenmark in the 1923 reform, the Deutsche Mark found immediate acceptance, hoarded inventories being offered for sale against DM starting the day after the reform. The virtually instantaneous acceptance of the new currency before the sufficiency of the monetary cut could be assessed stresses the prime importance of broad popular support for the reform. Such support derives on the one hand from the desire to return to a functioning monetary system of exchange, on the other hand from the perceived decisiveness of the reform announced to attain that goal. In the limit, the actual rate of conversion might matter less then the perceived determination of the authorities to carry the program through. Indeed, as Lt. Tenenbaum stressed in the discussions leading up to the reform, a bold reform with an, ex post, incorrect conversion rate might well be preferable to a timid conversion at the, ex post, appropriate rate[35]. In Germany, the initial conversion took place at a rate of 10RM to 1DM, with half of the converted funds blocked. As Table 11 and figure 1 illustrate, this rate, ex post, indeed turned out to be too generous: the half year following the reform was marred by inflation.

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[35]The importance of public confidence was not universally accepted. Thus Schacht, who had been decisive in implementing the 1923 reform, predicted the collapse of the DM within a few weeks due to a lack of reserves. See schlesinger(1989)

Figure 1


GERMAN INDUSTRIAL PRODUCTION
(index 1936=100)
140
130
120
110
100
90
80
70
60
50
40
1948
1949
1950
1951

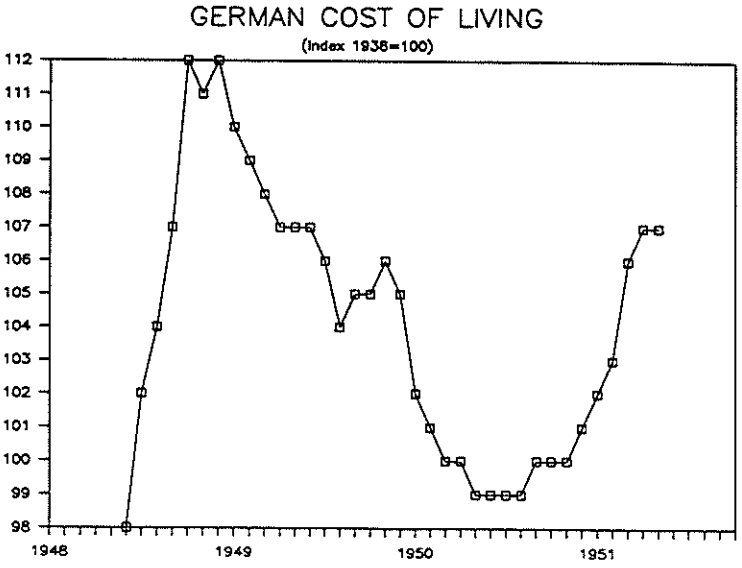
GERMAN COST OF LIVING
(index 1936=100)
112
111
110
109
108
107
106
105
104
103
102
101
100
99
98
1948
1949
1950
1951

Table 11 Money Supply and Exchange Rate in Germany

	Currency	Free Deposits	Material Prices (1938=100)	Free exchange rate Swiss Francs/100 DM
7.48	3831	6131	158.6	35
8.48	4178	7683	171.9	28.5
9.48	5358	8696	178.8	27.5
10.48	5885	9396	187.7	23
11.48	6017	10398	190.1	19.75
12.48	6319	10789	192.6	19.5
4.49	6334	12827	186.8	

Source : BIS Annual Report 1949 , p.175

The availability of the blocked accounts provided the authorities with a means to "fine-tune" after the response of the economy to the initial reform became known. Responding to the inflation, 70% of the blocked accounts were canceled in a second step, with 20% being released and 10% continued to be blocked for later conversion into interest bearing assets. The negative wealth effect , combined with restrictive monetary policy, dominated the liquidity effect from the additional released funds, prices stabilized at year end. The success of the reform is mirrored in the decline of the black market premium.[36]

On the real side, there is no shortage of stories about the immediate, dramatic effects on economic activity unleashed by the monetary reform. Prior to the reform, absenteeism had been the rule. From December 1947 to May 1948 absenteeism averaged 14.7 percent of the work force. After the

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[36] Some price controls were retained after the reform, for these goods, the black market premium continued to be positive, the black market price reflecting the shadow cost of the commodity.

reform, it fell off to 9.6 percent in June 1948 and 6.3 percent in July 1948.[37]

The strong increase in industrial production and economic activity is brought out in Figure 1. On the basis 1936-100 the index of production stood in June 1948 at 51. By the end of the year it had reached 79 and in April 1949 it had already climbed to 89. Of course, these numbers must be judged with some caution. During the period of complete control and rationing production may have taken place already, but not officially recorded as goods were diverted to the gray market for barter.[38] Even so, there is little doubt that the liberalization made a decisive contribution to the productivity of the economy. The rapid expansion in output over the next three years was sustained by a strong growth in real wages, generating the flow demand.

While monetary reform and price decontrol are important as critical preconditions of the "economic miracle", continued growth depended on a number of real factors, in particular the substantial fiscal measures implemented in conjunction with the monetary reform.[39]

Tables 12 and 13 illustrate the drastic nature of the fiscal measures accompanying the monetary reform, in particular the major reduction in marginal tax rates, as well as the resulting development in total revenues.

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[37] See Guggenheim (1965) p.37.
[38] See footnote # 34.
[39] See Wandel (1989) who argues that the Erhardt measures accompanying the introduction of the DM were the really crucial reforms of 1948 in bringing about the revival of markets and activity.

Table 12 Tax Rates Germany

Income Bracket	1915	1946	1948	% Reduction 1948 to 1946
0 - 600	-	-	-	
750 - 1.200	12	17	12	- 29
1.200 - 2.400	18	25	18	- 28
2.400 - 3.600	37	50	24	- 52
4.800 - 6.000	42	55	36	- 34
7.200 - 9.000	42	55	48	- 13
13.200 - 15.600	55	70	60	- 14
18.000 - 24.000	67	85	66	- 22
60.000 - 100.000	67	95	90	- 5
>250.000	67	95	95	0

Source : Heller (1949)

Table 13 Tax Receipts Germany
(Percent)

Source	Share in Revenue 47/48	1949	Change in Tax Yield
Income			
Individual	39.5	35.2	- 4
Corporate	5.2	9.4	92
Property	10.5	0.5	-94
Inheritance	1.3	0.1	-92
Turnover	16.2	23.8	56
Excise	18.4	20.6	19
Customs	1.1	1.0	- 5
Motor Vehicle	1.9	3.0	61
Other	5.4	4.7	- 7
Berlin Tax		1.3	
Total			6.9

The 1949 data are guesstimates based on the first (for the French zone first and second) quarter data.
Source: Heller(1949) and own calculations.

Supplementing decontrol, monetary and fiscal reform the government undertook further steps along an explicitly pro-growth, pro-market strategy

to revive the economy and restore prosperity. Among the characteristics of West German economic policies over the post reform years, a determinedly conservative fiscal policy assumed particular importance. In addition to providing resources for private and public investment[40] the government further stimulated investment by substantial investment tax credits and subsidies.

In addition, the "economic miracle" derived further support from the availability of skilled labor, a high domestic savings rate coupled with capital inflows from the Marshall plan as well as private foreign investment and the sustained domestic replacement demand for capital goods and durables.

In the context of the economic miracle it is critical to emphasize that a complete trade and foreign exchange reform was not part of the initial measures. While foreign trade transactions were progressively liberalized[41], exchange control did continue into the early 1950s on a substantial scale[42]. Convertibility was slow to come about.

In conclusion, there is little doubt that the German reconstruction measures of 1948 involved hardship. But what were the alternatives ? And did not the subsequent economic performance warrant the initial investment in decisive measures?

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[40] The government actually ran budget surpluses on current account. (See Stolper and Roskamp (1979).

[41] The initial liberalization was temporarily undone in 1950/51 as a mounting deficit developed. From 1951 onward, liberalization proceeded uninterrupted.

[42] See Milward(1984) and Kaplan and Schleiminger (1989)

VIII. AFTER THE REFORMS

In the period 1948-59 all of Europe rebuilt their economies, gradually reestablished financial systems and liberalized, step by step, external trade and payments. External convertibility was mostly attained by 1958, though some countries, in particular France and the UK took much longer to reach that goal. Considering the relatively uniform starting conditions of the continental countries and the homogeneity of monetary reforms illustrated above, the markedly different performance of these economies over the ensuing decade is striking.

Table 14 Comparative Performance: 1949-59
(Average Annual Percentage Rate)

	Per Capita GNP 1949-59	Inflation 1950-59
Belgium	2.4	2.2
Denmark	2.6	3.5
Germany	6.3	3.1
France	3.6	6.3
Italy	5.5	3.1
Netherlands	3.3	3.7
Norway	3.3	5.7
Austria	5.6	7.0
Sweden	2.8	4.9
Switzerland	3.8	1.9
UK	2.1	4.4

Source: Postan and IMF

While Austria, Germany and Italy experienced rapid growth, others, notably Britain, did quite poorly. The absence of a clearcut correlation

between the severity of the wealth tax imposed in the course of monetary reform and the subsequent growth performance raises two issues. First, it provides suggestive evidence against the view that conversion, by reducing the assets of the potential capitalists, lowers the attainable growth rate. Secondly, it raises the question which factors can explain the divergent performance record. Two issues raised in this respect are the importance of economic philosophies and the contribution of external aid in the form of the Marshall Plan.

Very different economic philosophies were applied in different countries. While Britain and the Netherlands favored intervention, Erhard in Germany and Einaudi in Italy preached and (to a somewhat lesser extent) practiced market-oriented policies.[43]

The end of World War II found all European countries faced with the need for external finance to rebuild their ravaged economies. The willingness of the United States , as the sole surplus country, to provide funds may have been critical in providing support for the European post war boom, both by providing means to acquire raw materials and by generating an intra-European demand boost[44]. Relatively little evidence is available on this issue.[45]

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43 See Stolper and Riskamp (1976) on this point.
44 See Moller(1989), Milward(1984) and Kaplan and Schleiminger(1989)
45 The question has been asked for the case of Italy in Casella (1987).

Table 15
Marshall Aid July 1948 - June 1949

Country	National Income Million $	Net total aid Million $	Ratio %
Austria	2.000	279	14.0
Belgium/Lux.	7.000	40	0.6
Denmark	3.500	116	3.3
France	20.000	1304	6.5
Germany (Tri)	17.000	501	2.9
Greece	1.500	212	14.1
Iceland	100	5	5.0
Ireland	1.000	78	7.8
Italy	10.000	535	5.3
Netherlands	5.000	541	10.8
Norway	2.000	115	5.8
Sweden	6.500	22	0.3
United Kingdom	40.000	949	2.4
Total ERP	123.700	4.743	3.8
USA	230.000		

Source : BIS, Nineteenth Annual Report 1949, page 20

Each of these questions is relevant to the experience of E. Europe and the Soviet Union today. The presumption flowing from the experience of the postwar stabilizations might be summarized as follows:

Monetary reform is an alternative to hyperinflation. Monetary reform, early and decisive, is an essential precondition for reconstruction. It deals only with balance sheets or stocks; long term success requires a fiscal policy solving the flow problem.

- Serious supply side policy, in particular on the tax front, facilitates the transformation from planning to the market.

- External aid will help reconstruction and may be an essential ingredient in stabilization.

- Monetary reform is necessary but not sufficient.

APPENDIX I. DETAILS OF MONETARY REFORM

Austria 7.1945,11.1945,11.1947
New national currency (shilling). Sizable portion of currency and bank deposits blocked. Withdrawal for wage payments allowed. Account to account transfers allowed. Initial reform failed due to monetization of budget deficit. In 1947, conversion of currency and deposits at 1:3

Belgium 10.1944
Blocking of currency and bank accounts. Withdrawal for wage payments allowed. Capital levy and war profit taxes imposed. Frozen accounts converted into forced loans. Anti inflationary intent failed as expenses for Allied army were monetized.

Bulgaria 3.1947 and 5.1952
Partial blocking of currency and deposits. In the conversion, holdings of private business treated unfavorably. Second reform closely modelled on Soviet example.

Czechoslovakia 10.1945 and 6.1953
New currency (Crown) introduced. Sizable part of money supply blocked. Withdrawal possible for wage payment. Progressive war gains tax and capital levy. No discernible effect on inflation. Second reform closely modelled on Soviet example and successful.

Denmark 7.1945
Partial blocking of currency and deposits for three months. Information gathering about asset distribution main objective of blocking. Virtually all funds unblocked. Later imposition of war gains tax and forced loan.

Finland 1.1946
No blocking of deposits. Banknotes above 100 Finmark cut into two halfs, one serving as legal tender at one half the denomination, the other as nonnegotiable government bond. Only 8% of money supply affected. Virtually all funds later unblocked. Little success in curbing inflation.

France 6.1945, 1.1948
Partial blocking of large notes. Virtually all blocked funds returned . No restraining effect on inflation.

Germany (East) 6.1948
Writedown and partial blocking. Price controls continued.

Germany (West) 6.1948

Writedown at 1:10 and blocking of deposits. Later further writedown. Prices and wages freed.

Greece 11.1944
Conversion at 50 billion to one in midst of hyperinflation. No budgetary adjustment. No success in halting inflation.

Hungary 12.1945 and 8.1946
Initial conversion of currency at 4 to 1 proved unsuccessful in light of continued deficit monetization. Introduction of parallel currency (tax pengo) resulted in temporary stability. After rekindling of inflation a second conversion, covering both currency and deposits, at 400 octillion to one, succeeded in terminating the hyperinflation.

Netherlands 6.1945 and 9.1945
Notes above 100 Guilder ceased to be legal tender but could be deposited in bank accounts which were then blocked, except for tax and wage payments allowed. Account to account payments allowed. Inducement to convert blocked balances into 50 year bonds. Later partial blocking of remaining currency and all bank deposits. War profits taxes and capital levy.

Norway 9.1945
Partial blocking of money supply. Determination of asset distribution main objective. Later imposition of war profit tax and forced loan.

Poland 12.1944 and 10.1950
Occupation moneys exchanged into new currency (zloty). Excess currency holdings blocked. Second reform modelled on Soviet example.

Rumania 8.1947 and 1.1952
Modelled on the Soviet example. Bank deposits favored vis-a-vis currency. Price and wage structure revised and lowered.

USSR 12.1947
Conversion rate depended upon amount exchanged. Deposits favored relative to currency.
Formed the role model for the monetary reforms in Eastern Europe.

Yugoslavia 4.1945
Occupation moneys partially exchanged for dinars. Additional currency holdings and bank deposits blocked. Capital levy on monetary wealth.

Table A2 Overview of Monetary Reforms

Country	Currency Blocking	Deposit Blocking	New Currency	Forced Loan/Tax	Conversion Rate M1	Conversion Rate M2/M3
Austria I	No	Yes				
Austria II	Yes	Yes	Yes			
Austria III					1:3	1:3
Belgium	Yes	Yes		Yes	1:1	
Bulgaria I				Yes		
Bulgaria II					1:100	****
Czechos. I	Yes	Yes	Yes	Yes	1:10	1:6
Czechos. II						****
Denmark	Yes			Yes		
Finland	Yes			Yes		
France I	Yes	No				
France II	Yes	No				
Greece	No	No			1:5E10	1:5E10
Germany (East)	Yes	Yes	Yes			****
Germany (West)	Yes	Yes	Yes		1:10	1:14
Hungary I					1:4	---
Hungary II					1:400	octillion
Netherlands	Yes	Yes		Yes	1:1	1:1
Norway	Yes	Yes		Yes	1:1	1:1
Poland I			Yes			
Poland II					1:100	1:33.3
Rumania I	Yes	Yes				
Rumania II					****	****
USSR	No	No			1:10	****
Yugoslavia	Yes	Yes	Yes	Yes	Multiple	Rates

****: USSR conversion of deposits : 1:1 on first 3000 roubles, 1:1.5 on next 7000 roubles, 1:2 thereafter.
Conversion rates for deposits in Poland differed according to type of deposit. Rate given is lowest.
Rumanian rates for the following ranges : 0-1000, 1001-2000, 2001-3000, > 3000 were:Currency : 1:100 , 1:200 , 1:300 , 1:400
Deposits : 1:50 , 1:100 , 1:150 , 1:200.
Bulgarian Conversion rate for deposits varied between 1:4 and 1:200, depending on type of deposit.
Conversion rate for Czechoslovakia II between 1:10 (Ames) and 1:4 (Pesek).
East German Conversion rates for savings deposits : 1:1 for first 100 RM, 1:5 for next 900 RM, 1:10 thereafter.
Sources : Ames(1954), Gurley(1953), Klopstock(1946), Pesek(1958)

APPENDIX II. GERMAN MONETARY REFORM

1936	: Price stop
1938	: Wage stop
1943/44	: Proposals by Ellis and Haberler regarding "Recommended Policies for the Allied Military Government in Germany"
1944	: Directive ICS 1067 instructed American Military Government not to interfere in German currency question
1945	: Allies agree on common military currency
1945-1948	: More then 300 currency reform proposals published
Mid 1945	: Representatives of four powers meet in Berlin to discuss currency reform
9.1945	: Finance Group of General Clay's staff (FGUS) submits proposal to Allied Control Council.Across the board devaluation of 1:10 proposed.
1.1946	: Colm/Goldsmith delegation send to Germany to study currency reform issues.Collaborated closely with Clay's financial adviser, Dodge.
4.1946	: First version of the Colm-Dodge-Goldsmith plan (CDG)
5.1946	: Final version of CDG plan submitted to General Clay.Covered currency reform in all four zones in accord with Potsdam agreement.
12.1946	: United Kingdom drops insistence on four power agreement on currency reform.
9.1947	: Decision to go ahead with currency reform without Soviet Union and possibly without France made. Special Office "Money and Credit" (Sonderstelle Geld und Kredit) founded to deal with questions of currency reform.
10.1947	: Production of DM begins in USA
2-4.1948	: Bank notes arrive in Germany.Utmost Secrecy. France agrees to participate
3.1948	: Soviet Union withdraws from the Allied Central Authority Bank deutscher Laender founded
18.4.1948	: Homburger Plan : Conversion rate 1:20 with 50DM per capita initial allotment and 15 % of blocked accounts to be released over time.
20.6.1948	: Payment of 40 DM per capita.
21.6.1948	: Reichsmark ceases to be legal tender, replaced by DM. Monetary claims converted at 1:10.Half of the converted currency and deposits immediately available.
27.6.1948	: Third currency law : Treatment of deposits and monetary debts
8.1948	: Second installment of per capita allotment
30.10.1948	: 70 % of blocked accounts cancelled, 20 % freed , 10% further blocked for future purchase of interest yielding bonds

GERMANY: ECONOMIC INDICATORS: 1948-51 (Source: Wallich THE MAINSPRINGS OF GERMAN REVIVAL)

Month	Industrial production 1936 = 100	Employment (millions)	Unemployment (% of labor force)	Basic materials prices 1950 = 100	Factory prices 1950 = 100	Cost of living 1950 = 100	Gross hourly wages 1950 = 100	Currency and demand deposits (billions of DM)	Time and savings deposits (billions of DM)	Bank loans (short and long term) (billions of DM)	Rediscounts (monthly average) (billions of DM)	Discount rate	Exports (millions of $)	Imports Total (millions of $)	Imports Commercial (millions of $)	Net foreign exchange reserves (millions of $)
June	51	13.5	3.2		n.a.	98	76.6	n.a.	n.a.	1.5						173
July	60			77	103	102		n.a.	n.a.	2.4		5				146
August	65			83	106	104		n.a.	n.a.	3.2			60.4 av.	165.9 av.	59.3 av.	161
September	71	13.5	5.5	87	108	107	83.5	12.3	4.2	3.8						186
October	76			91	109	112		13.2	3.4	4.5						224
November	81			92	105	111		14.0	3.0	4.6	—		70.1 av.	180.1 av.	47.1 av.	243
December	79	13.7	5.3	93	106	112	88.1	14.3	3.2	5.2	—					283
1949																
January	81			92	106	110		14.2	3.5	5.5	1.5	5	74.4	124.7	32.7	333
February	83			91	105	109		14.4	3.8	5.9	1.5		83.2	165.7	93.5	338
March	85	13.4	8.0	90	105	108	90.1	14.6	4.0	6.3	1.6		96.1	166.9	52.9	359
April	85			89	104	107		15.0	4.2	6.6	1.6		88.3	163.3	68.9	402
May	87			91	104	107		15.1	4.5	6.9	1.5	4½	101.4	222.8	155.1	431
June	88	13.5	8.7	92	101	107	93.3	15.6	4.3	7.8	1.2		91.2	208.8	137.4	401
July	87			92	102	106		15.8	4.5	8.3	1.3	4	100.9	179.0	122.7	367
August	89			93	101	104		16.1	4.7	9.0	1.6		97.6	219.1	181.0	333
September	91	13.6	8.8	93	101	105	91.8	16.4	4.7	9.6	2.0		102.0	161.0	98.8	295
October	97			96	101	105		16.9	4.8	10.6	2.5		80.9	190.7	99.3	253
November	104			95	100	106		16.9	5.0	11.3	3.3		87.9	169.0	109.1	204
December	98	13.6	10.3	91	100	105	95.5	19.6	5.2	11.9	3.6		115.1	275.7	189.3	151
1950																
January	93			95	100	101		17.1	5.5	12.6	3.6		104.4	230.1	172.3	87
February	96			95	100	101		17.1	5.9	13.2	3.7		112.4	168.3	131.3	2
March	99	13.3	11.1	95	99	100	96.5	17.3	6.1	13.8	3.9		139.7	195.5	158.7	—6
1950																
April	103			95	98	100		17.6	6.4	14.2	3.7	4	137.7	177.7	144.3	31
May	109			95	98	99		17.9	6.7	14.5	3.5		140.3	161.1	118.8	66
June	110	13.8	10.0	96	98	99	97.5	18.0	7.0	15.1	3.4		153.0	187.9	149.2	126
July	111			98	98	99		*	*	15.6	3.3		171.6	225.4	163.7	116
August	117			100	99	99		*	*	16.2	3.1		157.1	205.3	174.3	86
September	115	14.3	8.2	105	100	100	100.6	18.9	7.5	17.2	3.6		163.2	239.1	210.1	—6
October	131			106	101	100		*	*	18.2	4.5	6	214.1	311.9	263.2	—106
November	133			108	102	100		18.9	7.9	18.8	4.6		253.0	286.6	238.9	—124
December	131	14.2	10.7	111	106	101	105.3	19.2	8.2	19.5	5.1		241.1	314.8	273.5	—158
1951																
January	124			116	111	102		18.4	8.5	19.9	4.7		218.9	295.3	257.8	—184
February	130			119	115	103		18.6	8.7	21.0	5.0		232.7	290.6	253.6	—219
March	133	14.2	9.9	121	118	106	109.0	18.6	8.8	20.4	4.8		259.2	299.0	250.9	—182
April	136			121	119	107		18.6	8.9	20.5	4.4		273.5	256.4	206.4	—107
May	138			118	120	107		18.8	9.0	20.7	4.3		272.9	249.5	193.3	4
June	136	14.7	8.3	118	119	108	117.2	19.6	9.3	21.3	4.3		297.2	255.0	209.7	77

APPENDIX III ASSORTED STATISTICS

Table A3-1 Money Supply and Prices

	Real Money Supply[a]				Nominal Money Supply[b]	WPI[c]	CPI[c]
	1945	1946	1947	1948	1948	1948	1948
Austria		333	160	173	626	357	370
Czechoslovakia	95	133	183	216	670	317	294
Denmark	211	210	198	183	362	239	169
Finland	132	150	142	141	1244	960	805
France	106	76	63	45	805	1917	1802
Italy		70	73	88	4509	5697	4917
Netherlands	68	114	120	119	302	267	214
Norway	198	249	268	274	455	186	157
Portugal	180	184	187	178	415	256	215
Spain	105	98	100	98	196	324	303
Sweden	171	175	164	171	294	199	156
Switzerland	126	131	133	140	266	219	164
UK	184	184	160	143	259	225	142

[a]Jan.-June 1939=100, [b]June 1939=100, [c]Prewar=100
Source : BIS Annual Report 1949, p.63, 112

Table A3-2 Nominal Wages 1948 (1937=100)

	Local currency	US $
Belgium	420	284
Czechoslovakia	259	148
France	1140	131
Italy	5280	175
Netherlands	182	125
Sweden	197	215
Switzerland	187	187
UK	183	149
US	213	213

Source : BIS Annual Report 1949 p 114

Table A3-3 CPI (1937-100)

	1945	1946	1947	1948	1949
Austria	127	160	316	481	695
Belgium		333	339	389	372
Denmark	162	161	166	170	170
Finland	292	467	606	815	854
France	436	746	1207	1925	2200
Greece	1909	14625	17586	24909	28050
Ireland	173	171	186	186	188
Italy		2823	4575	4844	4886
Luxembourg	215	272	284	302	329
Netherlands	176	192	199	206	216
Norway	160	164	165	164	164
Poland	7597	9108	12134	12849	12970
Portugal	188	208	211	205	218
Spain	275	361	424	453	489
Sweden	145	146	150	157	161
Switzerland	153	152	159	164	162
Czechoslovakia	188	341	326	322	

1945-1948 : Annual average, 1949 : latest available
Source : Wirtschaftsjahrbuch 1950

Table A3-4 Nominal Money Supply (Millions, local currency)

	6.1939	12.1945	12.1946	12.1947	12.1948
Austria	900		5.656	4.326	5.635
Belgium	22.212	71.798	73.891	79.761	84.861
Czechoslovakia	10.740	24.233	43.589	58.539	71.997
Denmark	446	1.561	1.633	1.641	1.614
Ireland	16	42	45	48	50
Finland	2.200	13.598	18.233	25.162	27.369
France	122.611	579.093	733.797	920.831	987.621
Greece	8.002	104.083	537.463	973.609	1.052.000
Iceland	12	177	167	107	175
Italy	21.533	382.050	512.400	794.988	970.853
Netherlands	1.045	1.386	2.744	3.010	3.152
Norway	475	1.478	1.933	2.088	2.159
Poland	1.848	26.319	60.066	91.483	130.713
Portugal	2.096	8.166	8.793	8.752	8.696
Spain	13.536	18.961	22.777	26.014	26.472
Sweden	1.059	2.782	2.877	2.895	3.113
Switzerland	1.729	3.835	4.091	4.383	4.594
UK	1.729	1.375	1.422	1.350	1.293

Source: BIS (1949)

Table A3-5 National Income, Local Currency, Factor Cost
(Current Prices)

	1937/38	1945	1946	1947	1948	1949
Austria	7			18	22	29
Belgium	65200		190600	214550	243900	249100
Denmark	6360	11968	13386	14434	15485	16480
France	369		2476	3181	5712	6929
Italy	136			5567	6575	6975
Netherlands	4904	4170	9326	11251	12697	14139
Norway	3741	4462	7064	8249	9141	9640
Poland	15400			14728	18017	
Spain	26726	63259	90415	102693	108517	
Sweden	12070	19400	21350	23390	25810	26450
Switzerland	8702	13468	15033	16842	17550	
Czechoslovakia	55		155	194	213	
UK	4638	8355	8249	9071	9928	10226

Source : UN Monthly Bulletin of Statistics

Table A3-6 Industrial Production (1937=100)

	1945	1946	1947	1948	1949	1960	Growth 1948-1960
Austria			51	89	118	293	9.9 %
Belgium	31	72	86	92	94	140	3.5 %
Czechos.				108	123		
Denmark	74	101	116	129	137	229	4.8 %
Finland	88	107	119	137	143	282	6.0 %
France	39	73	87	102	112	208	5.9 %
Germany(E)		100	128	168	207		
Germany(W)		34	39	60	90	283	12.9 %
Greece	33	53	67	73	87	301	11.8 %
Hungary					125		
Ireland	96	109	117	130	139	223	4.5 %
Italy	29	71	91	99	109	292	9.0 %
Luxembourg		59	75	100	96		
Netherlands	32	75	95	114	127	266	7.1 %
Norway	69	100	115	125	132	229	5.0 %
Poland	48	86	108	141	176		
Rumania				84			
Russia	77	81	93	114	137		
Spain	131	154	157	160	152	339	6.7 %
Sweden	113	137	141	150	155	234	3.7 %
UK		90	98	109	117	177	4.0 %
Yugoslavia		90	138	171	192		

Notes :Germany (West) : 1936=100,Germany (East) : 1946=100
Russia : Moorsteen Powell Index,Spain : 1935=100
Source : Grotius (1949) , Wirtschaftsjahrbuch (1948,1949,1950) , Mitchell (1978)

Table A3-7 US Foreign Aid 1945-1948
(Million US $, % of US GNP)

	Mill. $US	% of GNP
1945	7481	3.5
1946	5509	2.6
1947	8703	3.7
1948	4995	1.9

Source : BIS, Nineteenth Annual Report 1949, p. 7

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