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*The Beginning of the Depression in Germany*¹

BY PETER TEMIN

THIS article tests a hypothesis about the origins of the international financial crisis of the early 1930's. The hypothesis was presented both in the report of the Macmillan Committee and in the analysis of the depression written by Bertil Ohlin for the League of Nations, and it has been repeated in many academic studies, both of the 1930's and of the 1960's.² It states that the diminution of capital exports from the United States to Germany in the last years of the 1920's produced the economic decline in Germany that then spread to other European countries.

The hypothesis appears in its most extended form in a 1934 National Bureau of Economic Research study of the German business cycle in the 1920's, where it is part of a description of fluctuations after the stabilization of the mark in 1923. The study asserts that the recovery in 1924-5 was due to an inflow of foreign capital stimulated by stabilization and the deliberations of the Dawes Committee. It goes on to say:

Just as revival in the autumn of 1924 and the following winter paralleled widespread foreign borrowing, so the difficulties that became more and more apparent in mid-1925 were associated with a marked decline in the inflow of foreign funds. . . . Demands for funds overwhelmed the [German] banks. The desire to preserve liquidity caused them to turn down fresh demands for money and even to call in older loans, especially smaller advances.³

The recession of 1926, in other words, was caused by a domestic credit contraction due to a decrease in the rate of capital imports. We may assume that the causal link between the recovery of 1924-5 and the concomitant capital inflow was the same: a loosening of domestic credit conditions caused by the capital inflow. The reasoning is that in any country where foreign currency or gold can be used for banking reserves, the volume of the domestic money supply—and domestic credit in general—will be affected by changes in the balance of payments. If there is a balance-of-payments surplus, that is, an excess of capital imports over the deficit on current account, there will be an accumulation of foreign exchange or gold; the domestic money supply will rise, and domestic credit conditions will ease. If there is a balance-of-payments deficit, foreign exchange or gold will be

¹ This research was sponsored by the National Bureau of Economic Research.

² Great Britain, Committee on Finance and Industry (Macmillan Committee), *Report* (H.M.S.O. 1931), p. 81; League of Nations, *The Course and Phases of the World Economic Depression* (rev. edn, Geneva, 1931), p. 214; James W. Angell, *The Recovery of Germany* (rev. edn, New Haven, 1932), p. 363; H. W. Arndt, *The Economic Lessons of the Nineteen-Thirties* (1944), p. 29; Carl T. Schmidt, *German Business Cycles, 1924-1933* (New York, 1934), pp. 49-50; Stephen V. O. Clarke, *Central Bank Cooperation, 1924-31* (New York, 1967), pp. 147-8; David S. Landes, *The Unbound Prometheus* (Cambridge, 1969), pp. 370-2.

³ Schmidt, *op. cit.* pp. 35-6.

lost, and domestic credit will contract. Any decrease in capital imports that increases the deficit will lead to a credit contraction.¹

This is a description of the results of an *autonomous* fall in capital imports; a fall in capital imports in response to, or offsetting, a decline in imports will not have these effects. If commodity imports and capital imports fall together, there will not be a deficit in the balance of payments or a shortage of credit: the decline in purchasing power will be the same as the decline in purchases, and consequently there will not be any reason for banks to contract. We therefore can test the hypothesis as it relates to the recession of 1926 by asking if the recession was associated with a deficit in the balance of payments and a scarcity of credit.

The recovery from this recession, the study continues, was related to the resumption of the capital inflow which “undoubtedly played an important part in influencing the return of easier credit conditions”.² The boom continued for the next two years, accompanied by a steady capital inflow. But it could not last for ever:

by the middle of 1928 [the] German economy had entered a fairly late phase in the process of expansion. Substantial capital expenditures in industry and housing accommodation were paralleled by a growing stringency of capital supplies. . . . German economic activity, so closely dependent upon the international credit situation, was beginning to slacken.³

The reference to a “late phase” of expansion is obscure. It appears to represent a belief in the inevitability of a contraction stemming from internal causes, a belief that stands in opposition to the one implicit in the detailed description of international capital movements which follows the passage quoted. As is typical of many studies, the author mentions many causes without trying to integrate them into a single model. To the extent that there is a model in these studies, however, it is the one used in the description of the 1926 recession.

This can be seen clearly in the more detailed description of events in 1928–9 given by David Landes in his recent survey of European industrial development:

In the earlier years [of the 1920's], much of this flow [from America to Europe] took the form of capital movements, that is, the purchase of European securities by American investors. But by the late twenties, this source of supply thinned out, as rapidly appreciating American common stocks proved more attractive; and the transfer of funds took the far more dangerous form of short-term or call loans, placed in Europe by bankers who were attracted by higher interest rates. Once again Germany was the extreme case: fully one half of the money that came in from abroad from 1918 to 1931 (10·3 out of 20·6 billion RM.) took the form of short-term credits. These served for a while to sustain the expansion, but then speculation on the American exchanges grew so frenetic that the price of short loans to cover securities transactions on the United States rose well above the European level. By late 1928 and early 1929 American banks began calling their

¹ This connexion between the domestic money supply and the balance of payments, of course, is the one assumed in discussions of the price–specie–flow mechanism. It has been incorporated into Keynesian models of income determination, producing an “income–specie–flow” mechanism, by Robert A. Mundell, *International Economics* (New York, 1968), ch. 15, and Richard N. Cooper, ‘Macroeconomic Policy Adjustment in Interdependent Economics’, *Quarterly Journal of Economics*, LXXXIII (1969), 1–24.

² Schmidt, *op. cit.* p. 42. ³ *Ibid.* pp. 47–8.

European loans, so that net exports of capital from the United States, which had risen from less than \$200 million in 1926 to over a billion dollars in 1928, plunged to \$200 million again in 1929.

This withdrawal of support put tremendous pressure on the European banking system, particularly on the great German banks, which had always followed the policy of borrowing short and lending long. The result was a brutal contraction of credit, which made itself felt in every corner of the economy.¹

The explanation for the downturn in 1929 to be found in the literature is thus the same as the explanation advanced for the recession in 1926. The test of the explanation accordingly is the same also. Was there a balance-of-payments deficit in 1929? And did it lead to a credit scarcity that inhibited economic activity?²

Two logical difficulties with this explanation should be noted before we turn to the data. First, the withdrawal of American capital from Germany in 1928 and 1929 is said to have been caused by the profitable opportunities for investment on the New York Stock Exchange. But purchases of shares on the stock exchange do not represent investment in the Keynesian sense. They are transfers of ownership, not allocations of real resources. If people who were previously buying German stocks bought American ones instead, what did the people who sold the American stocks do with the money they were paid? If they did not send it abroad, they must have spent it at home or held it as idle balances. And if they did increase domestic spending or idle balances, it is on this that the explanation for the fall in capital export should centre, not on the stock market.³

Second, the withdrawal of foreign capital is supposed to have had its effect on income almost instantaneously. But the change in the balance of payments had to affect the money supply and then this change had to affect investment plans before income could be affected. Both of these processes take time, and we should be suspicious of any explanation of the fall of German income in 1929 that focuses on a change in the balance of payments starting late in 1928.

Turning now to the data, we start our review with data on the American balance of payments, as shown in Table 1. We shall follow the effects of changes

¹ Landes, *op. cit.* pp. 371–2.

² This hypothesis should be distinguished from the one advanced by Friedman and Schwartz. They say: The clinching evidence that the United States was in the van of the movement [i.e. the international contraction] and not a follower is the flow of gold. If declines elsewhere were being transmitted to the United States, the transmission mechanism would be a balance-of-payments deficit in the United States as a result of a decline in prices and income elsewhere relative to prices and income in the United States. That decline would lead to a gold outflow from the United States which, in turn, would tend—if the United States followed gold-standard rules—to lower the stock of money and thereby income and prices in the United States. However, the U.S. gold stock rose during the first two years of the contraction and did not decline, demonstrating as in 1920 that other countries were being forced to adapt to our monetary policies rather than the reverse.—Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States, 1867–1960* (Princeton, 1963), p. 360.

Friedman and Schwartz are testing a hypothesis about the United States using a model of international transactions that does not admit the existence of capital flows. This article tests a hypothesis about Germany, not the United States, and it cannot—clearly—ignore capital movements.

³ One possibility, of course, is that the increased volume of activity on the New York Stock Exchange required an increased quantity of money for *transactions* purposes in that market. The idea that “funds flowed into the stock market” might mean just that. But while the transactions demand for money rose in this sector, it is hard to believe that it rose very much. The market was very highly organized, and brokers and speculators did not hold large inventories of cash at the peak of the boom.

through the German balance of payments and the German credit market to find their impact on the level of the German national product.

Table 1. *U.S. Balance-of-Payments Data, 1924-9*
(millions of dollars)

<i>Capital movements</i> [outflow (-)]	1924	1925	1926	1927	1928	1929
U.S. direct	-182	-268	-351	-351	-558	-602
U.S. long-term	-703	-603	-470	-636	-752	-34
U.S. short-term	-109	-46	-36	-349	-231	-200
Foreign long-term	185	301	95	-50	463	358
Foreign short-term	228	-60	455	934	-117	196
Total	-581	-676	-307	-452	-1,195	-282
Gold movements	-256	100	-93	113	238	-143
Deficit*	-28	40	362	1,047	121	53

Source: *U.S. Historical Statistics*, p. 564.

* Clarke's definition: gold outflow plus net foreign short-term capital inflow.

Landes chronicled the rise and fall of total capital exports in the years before 1929,¹ but it is clear from Table 1 that capital exports fell in 1929 for reasons quite different from those behind the rise in 1928. Foreign holdings of short-term dollar assets rose in 1926 and 1927. They stopped rising in 1928, producing an abrupt rise in net U.S. capital exports. This change—if it was primarily German—would have produced a stimulus to expansion in Germany, but it is doubtful if the influence of foreign capital flows noticed so prominently by contemporaries and historians was confined to a single year. For if the cessation of the capital flow to the U.S. in 1928 was expansionary for Germany, the inflows in 1926 and 1927 must have been deflationary, making the net influence of this type of capital flow over the last half of the 1920's ambiguous or negative. In addition, this item shows a withdrawal of capital, albeit foreign, from the U.S. precisely at the time that the hypothesis in question asserts that capital was flowing into the U.S. It is likely that these flows represent balancing items in the overall balance rather than autonomous flows; they are interpreted this way in the calculation of the U.S. deficit (shown in Table 1) by Clarke.²

The fall in capital exports in 1929, on the other hand, was caused primarily by the fall in U.S. long-term capital exports, that is, in the purchase of foreign securities by Americans. Contrary to Landes's description, this flow had remained large and constant in the years before 1929. It fell sharply in 1929, quite possibly in response to competition from American stocks, and it is here—if anywhere—that the effect of the New York stockmarket boom on Europe is to be found.

Data on the German balance of payments are presented in Table 2. The composition of "capital movements not elsewhere classified" is unclear, but they appear to include the errors and omissions in the accounts. As errors and omissions tend to be concentrated in the capital account, I have treated these miscellaneous capital movements like long-term capital movements. None of the qualitative conclusions of the analysis would be changed if they were included with

¹ The data in Table 1 differ from those used by Landes because he used a contemporary estimate derived from data on the current account and gold flows. See League of Nations, *op. cit.* pp. 31-2.

² Clarke, *op. cit.* p. 148.

short-term capital movements "below the line". Foreign purchases of German stocks are included in long-term capital movements.

Table 2. *German Balance of Payments, 1924-9*
(million Reichsmarks)

	1924	1925	1926	1927	1928	1929
Balance on current account	-1,664	-3,045	-39	-4,244	-3,192	-2,469
Long-term capital movements	+2,000	+1,324	+1,376	+1,703	+1,788	+660
Capital movements n.e.c.	+413	+1,704	-916	+310	+1,000	+879
Balance	+749	-17	+421	-2,231	-404	-930
Short-term capital movements	+506	+107	+147	+1,779	+1,335	+765
Gold and foreign-exchange movements	-1,255	-90	-568	-452	-931	+165

Source: *Das deutsche Zahlungsbilanz der Jahre 1924-1933*, *Wirtschaft und Statistik*, Sonderheft 14 (Berlin, 1934), pp. 10-11.

As would be expected, the German balance of payments is not a mirror image of the American. The short-term inflow of foreign capital to the United States in 1926 and 1927, in particular, is not echoed by a corresponding short-term capital export from Germany. On the other hand, the decline in long-term capital exports from the United States in 1929 undoubtedly was related to the fall in long-term capital imports into Germany. As the latter was only two-fifths the size of the former, it is not unreasonable to assume that it was caused by the decline in the U.S. capital exports.¹ This is the movement that is universally blamed for initiating the German depression.

The parallel between 1926 and 1929 is instructive, for the downturns of both years are said to have been caused by a fall in capital imports leading to a credit stringency. It is true that capital imports fell in both years, but the balance of payments *improved* in 1926 nevertheless. Only if the decline in capital imports exceeds the fall in commodity imports can it result in a decline in domestic purchasing power and a resultant credit contraction. As noted earlier, if the decline in capital imports is offset by a fall in commodity imports, the net effect is simply the absence of the imported goods. This appears to have been the case in 1926. There was a decline in imports, presumably caused by a fall in German demand during the recession, and the capital imports by which they were financed fell with them. As the autonomous capital imports did not fall as much as the commodity imports, the overall balance moved into surplus.² We may reject a balance-of-payments deficit as the cause of the German recession of 1926.

Since the balance-of-payments deficit in 1929 rose with the fall in capital imports—although not as much—we cannot at this point reject it as a cause of the downturn of that year. Accordingly, we turn to the German credit market for

¹ The fall in new German securities floated in America was \$250 million, or 1,000 million Reichsmarks, which matches the fall in long-term capital imports to Germany. This fall was offset, according to German sources, by a rise in "other recorded capital movements" from the U.S. of about 400 million Reichsmarks. Nevertheless, the German source asserted that the capital flow from the U.S. to Germany was underestimated in 1928 and overestimated in 1929, so that the probable change in the bilateral balance was about 1000 million Reichsmarks.—League of Nations, *op. cit.* pp. 320-1; *Das deutsche Zahlungsbilanz der Jahre 1924-1933*, p. 29.

² If capital movements not elsewhere classified (n.e.c.) are placed below the line, the surplus in 1926 is shown as much larger than in Table 2, and the argument is reinforced. This change amounts to saying that all capital movements n.e.c. were balancing movements, not autonomous ones. For data on imports, see the source for Table 2.

evidence of a credit contraction caused by the balance-of-payments deficit. The short-term interest rates shown in Table 3 are the ones emphasized by Landes, although the critical capital movements were long-term. Data on long-term rates are hard to find because the German statistical office changed its method of calculating them in 1927. Prices of stocks and mortgage bonds are presented as

Table 3. *Financial Data, Germany, 1924-9*

	1924	1925	1926	1927	1928	1929
Interest rates (per cent)						
Call money	28.2	9.1	5.3	6.1	6.7	7.7
Monthly money	25.1	10.8	6.6	7.8	8.2	9.0
Security prices (index)						
Stocks	98	93	109	158	148	134
Mortgage bonds		79	92	97	92	89
Volume of new financing (1,000 million Reichsmarks)						
Total		7.5	11.5	13.0	15.1	9.3
From banks		6.1	7.7	8.9	9.8	6.0
From joint-stock companies		0.4	1.5	0.9	1.4	0.2
From public debts		0.7	1.7	1.1	2.0	1.4
Currency circulation (1,000 million Reichsmarks)	4.3	5.2	5.8	6.3	6.6	6.6

Source: *Statistisches Jahrbuch*, 1929, p. 334; 1930, p. 378; Walter G. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts* (Berlin, 1965), pp. 813, 815.

proxies, and they show roughly the same pattern as the short-term rates. Interest rates declined from the high levels that followed stabilization of the mark to a trough in 1926 or 1927 and rose thereafter until 1929. As the recession of 1926 either coincided with the nadir of interest rates or took place during their decline, the hypothesis that gives its cause as a credit squeeze is shown again to be wrong.

The high interest rates of 1929—which were not as high as those of 1925—were in line with the upward trend of the late 1920's. They seem therefore to indicate the similarity of credit conditions in 1929 and in the preceding years. But a rise in interest rates accompanying a fall in the level of national income is vastly different from a simultaneous rise in both. The German national product was rising from 1926 to 1928; the rise in interest rates indicates simply that the rise in production was outstripping the rise in available credit. The national product fell in 1929, and the persistence of rising interest rates in the face of this slackening of production calls for explanation.

Data on the volume of credit appear in the lower part of Table 3. The volume of new financing shown there is the *increase* in the net obligations of financial intermediaries, firms, and government bodies, plus the quantity of other government budget surpluses. There are no data on the money supply due to the difficulty of distinguishing between different types of bank liabilities, but the series showing new financing from banks gives a qualitative index of the *rate of change* of the money supply. In particular, it is hard to believe that demand deposits fell while other bank liabilities rose.¹ Consequently, we can conclude that the stock of

¹ The series on currency in circulation, which shows the *stock* of currency, indicates that this component of the money supply also did not fall in these years. For a discussion of German banking data in the 1930's see John J. Klein, 'German Money and Prices, 1932-44', in Milton Friedman, ed. *Studies in the Quantity Theory of Money* (Chicago, 1956).

money as well as the volume of credit outstanding in the economy did not fall in 1929. It did, however, grow less rapidly than in the previous years.

It is tempting to attribute this decline in the rate of growth of money and credit to the deterioration in the balance of payments in 1929. Commentators on the German economy stress the absolute dependence of German monetary conditions on the balance of payments.¹ The President of the Reichsbank complained that his hands were tied by international constraints.² And the magnitude of the change in the deficit in 1929 is more or less the right size to explain the fall in new bank credit (since foreign exchange can be used as bank reserves) which formed the major component of the decline in the growth of total credit, and which must have been in part a fall in the rate of growth of money.

There is, however, a problem with this inference: it assumes that the domestic credit market in Germany was more closely linked to the balance of payments than it actually was. For the years in which we have data, 1925–9, there is no correlation between changes in the supply of credit (or bank credit alone) and the deficit. The volume of new financing was high in 1926 when there was a balance-of-payments surplus, but it was higher in 1927 when there was a deficit. In fact, it was higher in 1927 than in 1929, although the higher deficit of the former year should have inhibited the growth of credit. Despite the protests of the President of the Reichsbank and other observers, the German credit market responded to forces other than the balance of payments.

Even so, the question now remains: did the level of German production respond to changes in the credit market? The supply of credit (and presumably that component of it classified as money) rose in 1929, albeit at a slower rate than before, while the level of production fell. Keynesian theory asserts that a fall in the stock of money is needed to produce a fall in the level of income. By this criterion the change in the credit market was too small to have initiated the depression. Modern quantity theorists, on the other hand, say that a fall in the rate of growth of the money stock will produce a fall in the level of income. The fall in income, however, follows the fall in the rate of growth of money only after a lag of a year or more.³ According to this theory, the change in the credit market was too late to have initiated the depression. Followers of both schools, therefore, would have to elucidate the mechanism by which the fall in the rate of growth of credit produced a fall in the level of production to make the argument convincing.

But it is here that the traditional hypothesis founders. Data on the net national product of Germany in constant prices are shown in Table 4. The declines of N.N.P. in 1926 (about 1 per cent) and 1929 (about 5 per cent) that we set out to explain are apparent in the table. Below the estimates of N.N.P. appear various components of the N.N.P., each one—with the exception of exports—being a component of the aggregate in the preceding line. In addition, each one is the most volatile component of the preceding entry, and fluctuations in each one account for almost all of the fluctuations in its predecessor. Thus the declines of N.N.P. in 1926 and 1929 were falls in net investment which fell by more than

¹ Angell, *op. cit.* p. 201; C. W. Guillebaud, *The Economic Recovery of Germany, 1933–1938* (1939), pp. 11–12; Schmidt, *op. cit.* pp. 88–9.

² Hjalmar Schacht, *My First Seventy-six Years*, translated by Diana Pyke (1955), p. 218.

³ Milton Friedman, 'The Lag in the Effect of Monetary Policy', *Journal of Political Economy*, LXXIX (1961), 447–66.

N.N.P. in both years. The fall in investment was in turn primarily a fall in industrial investment, which itself was almost exclusively a fall in inventory investment. The other component of investment to show a large fall in 1929 was net agricultural investment (which fell to zero), and the fall here was also mainly a fall in inventory investment. The sum of the change in industrial inventory investment and agricultural investment exceeded the change in N.N.P. in 1929.¹

Table 4. *German National Product and Components, in Constant Prices, 1924-9*
(1,000 million 1913 marks)

	1924	1925	1926	1927	1928	1929
Net national product	—	46.9	46.6	53.1	54.0	51.7
Net investment	—	5.4	3.3	8.1	6.9	3.6
Net industrial investment	6.0	3.1	1.0	4.3	3.5	1.3
Inventory investment	4.8	1.2	0.6	2.2	1.2	0.4
Exports	—	6.7	7.7	7.8	8.6	9.9

Source: Hoffmann, op. cit. pp. 246, 258, 822, 828.

It should be noted that although N.N.P. reached a peak in 1928, net investment and its components (including agricultural investment) did so in 1927. The fall in investment thus began *before* the withdrawal of credit from Germany noted in the literature and the contraction in the rate of growth of credit shown in Table 3. Even without examining the nature of the fall, it is hard to believe that it was due to a subsequent credit contraction.

The composition of the fall, in addition, indicates clearly that it was not due to a credit contraction. For the fall in income and investment in 1929 (as in 1926) was primarily a fall in inventory investment. If the fall in N.N.P. was the result of the credit contraction, then the restriction of credit must have caused inventory investment to fall. In terms of the call-money rate, which rose by 15 per cent from 1928 to 1929, inventory investment must have had an interest elasticity larger than *eight*, since it fell by over 120 per cent. In terms of less volatile long-term interest rates, the elasticity would have had to have been even higher. (If there was credit rationing, so that the volume of credit is a better indication of the state of the market than the cost of credit, then we are faced with the paradoxical picture of falling inventory investment in 1928 when the volume of credit was expanding at the fastest rate since stabilization of the mark.)

This is a high-interest elasticity under any circumstances, but it is particularly problematical for inventory investment. Recent research into the determinants of inventory investment in the United States has failed to uncover *any* significant or consistent relationship between credit conditions and inventory investment, much less a highly elastic one.² The large econometric models now being formulated for the United States do not even include the cost or availability of credit

¹ Hoffmann, op. cit. pp. 236, 258. Public building, which has sometimes been blamed for the decline in German N.N.P., was quite small in this period (400 million Reichsmarks at its peak in 1928 and 1929), and it did not decline from 1927 or 1928 to 1929.—Ibid. p. 258.

² See Michael C. Lovell, 'Determinants of Inventory Investment', in *Models of Income Determination*, Conference on Income and Wealth, xxviii (Princeton, 1964).

among the determinants of industrial inventory investment.¹ Conditions in post-war America are not the same as they were in Weimar Germany, but present knowledge gives no reason to think that they differed in this particular area. (Present knowledge also provides no alternative sources of data sufficient to duplicate the American research.) It is therefore entirely unreasonable to hypothesize a relationship between inventories and credit conditions in Germany in the late 1920's strong enough to explain the change in the former by changes in the latter.

Sales, unfilled orders, expectations; these are the items that we are told influence inventory investment. But these items are domestic. The steady growth in exports shown in Table 4 indicates that fluctuations there were not important. Instead, a decrease in the rate of growth of domestic demand with its attendant change in orders and expectations seems indicated as the probable cause of the reduction in German inventories. To elucidate the nature of this change, attention must be turned from the international economy to the domestic and from supply considerations to demand.

The argument, then, can be summarized as follows. There was a diminution of American long-term exports in 1929. There was no fall in U.S. capital exports before then, although a temporary (two-year) inflow of foreign short-term capital to the U.S. ceased in 1928. The deterioration of the German balance of payments in 1929 can be attributed to the fall in U.S. capital exports; the short-term inflow to the U.S. finds no echo in the German data. There was also a decrease in the volume of new credit made available in Germany in 1929, but there are problems in attributing this change to the deterioration of the balance of payments. Specifically, it requires the assumption of a link between the balance of payments and the German credit market that did not exist in earlier years of the 1920's, or at least that did not require the volume of domestic credit to vary immediately with changes in the foreign balance. But even if the increase in the balance-of-payments deficit did cause the decline in the rate of growth of domestic credit, it did not thereby cause the decline in the national product.

The German N.N.P. fell primarily because inventory investment fell, although other forms of investment fell also, and there are two reasons why this fall could not have been due to the credit contraction. First, it began before the credit contraction. And second, it fell much too far to be explained by the credit contraction, even assuming that present research indicated a firm connexion between credit conditions and inventory investment—which it does not. These reasons apply also to net agricultural investment, which fell from its peak in 1927 to zero in 1929. Therefore, the fall in American capital exports in 1929 could not have initiated the German depression.

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¹ I refer to the Brookings quarterly model and the Federal Reserve-M.I.T. model. The Brookings model uses an interest rate as an explanatory variable for inventories in trade, but it appears in the equations with either the wrong sign or a very large standard error. See Paul G. Darling and Michael C. Lovell, 'Factors Influencing Investment in Inventories', in James S. Duesenberry, ed. *The Brookings Quarterly Econometric Model of the U.S.* (Chicago, 1965); Frank de Leeuw and Edward Gramlich, 'The Federal Reserve-M.I.T. Econometric Model', *Federal Reserve Bulletin*, LIV (1968), 11-40.