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Recovery from the Great Depression in the United States, Britain and Germany

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Abstract

This paper examines the process of the recovery from the Great Depression in the United States, Britain and Germany in a comparative perspective. The U.S. and German governments spent more actively, while all three countries manifested monetary ease. This expansionary switch was made possible by currency devaluation (Britain and U.S.) or by exchange control (Germany), though the banking sector remained passive in industrial finance in Germany. Investment allocation, in particular, was more favorable to recovery in the U.S., and perhaps to a larger extent in Germany, where the *Motorisierung* and rearmament had greater repercussion effect to boost up total industrial production, partly because Britain suffered a long run depression of a more "structural" character.

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I. Issues

Since the relative stagnation of the world economy from the mid 1970s, economists have revived their interests in the Great Depression of the 1930s, if only because of its probable relevance to the contemporary problems. However, they seem to concentrate on the origins and the nature of the Depression and not to give as much attention to the recovery process as might be deserved. A tendency among those who examine the recovery phase is to stop at explaining the cause of the turning point, and characterize the recovery as a very slow and incomplete one. The literature mainly deals with governments' policy responses and their effects. But studies usually focus on a few specific measures, mostly in an individual country context.[1)]

This paper aims at examining the process of the recovery from the Great Depression in the United States, Britain, and Germany in a comparative perspective. Interindustry repercussion will be given particular attention. It especially concentrates on neglected issues, the structure of the effective demand and its implications for the nature of the recovery.

Specific features of the depression as it was suffered in each country are worth recapitulating. The interwar economies of the U.S., Britain, and Germany took somewhat divergent paths. The U.S. enjoyed a substantial boom in the 1920s, and thus the experience of the slump in the 1930s was more severe. As Figure 1 shows, the British decline was relatively mild. This is not because Britain suffered less in the 1930s, but rather because the British economy was in chronic recession in the 1920s, and the pain was therefore simply spread out over a longer period. The contrast in economic situations in the two countries is often attributed to the overvaluation of pound sterling relative to dollar in the process of returning to the gold standard. To maintain the high parity of sterling Britain was forced to maintain contractionary policy standards, which resulted in prolonged recession and high unemployment. Germany, being a defeated nation, went through devastating instability, with a heavy reparations burden and a period of hyperinflation. Temporal comparisons of Figure 1 in which Germany stood in between the two other countries belie the actual devastation of the German economy, as the unemployment

statistics in Table 1 show. The German "golden twenties" were often compared with the malaise of British 1920s (e.g. Broadberry and Ritschl 1994).

Besides, there were also differences in industrial performances. The British economy in the interwar years revealed its legacy of structural maladjustments, with the slump more pronounced in such staple industries as textiles, coal mining, iron and steel, and shipbuilding. The U.S. was hurt, in addition to those same sectors, in building materials, lumber, machinery, and transportation equipments. Depression more or less equally hit every sector of the German economy, including investment goods industries such as machine building. "Structural explanations relating to the obsolescence of 'old' industries, therefore, play little part in the explanation of the German slump" (Balderston 1994, p.4), the implications of which will be examined in due course.[2)]

Cyclical fluctuations occur frequently in capitalist economies; the downturn precipitated by the U.S. stock market crash can be approached through theories of business cycles. But it is much more difficult to explain the length and depth of the depression. Old debates about the proximate causes of the slump, among others between monetarists and their opponents, seem to have come to a truce for the moment. Newer dimensions have been added. Not only various new views began their experiments in the macroeconomic interpretations, but international repercussions have been increasingly put on the agenda. One survey sanguinely pulled out a "coherent picture" from the efforts of the past twenty years: they have succeeded in relating the depression to the structural changes of the economy through World War I and the 1920s. The durable goods boom and labor market rigidity in the United States, the fragility of world monetary system, and trends for international clearing to depend on U.S. lending have all been adequately investigated. They highlighted the critical role of the repercussion effects of restrictive U.S. monetary policy. In particular, it is claimed that individual countries were "fettered" to the gold standard and thus forced to pursue contractionary policies with the consequence of decreasing effective demand for investments and durables (Eichengreen 1992a, 1992b).

As Figure 1 and Table 1 show, all three countries turned to recovery phase after the trough of 1932. German recovery was especially rapid, a phenomenon in

itself posing difficulty in explanation, though some of the early decreases in unemployment figures may have come from statistical manipulation (Silverman 1988, Buccheim 1994).[3)]

Insofar as the above characterization of the causes of the depression is correct, it should follow that one might find the causes of the recovery in: an abandonment of the gold standard, expansionary macroeconomic policy, and demand stimulus. In other words, it is likely that the recovery phase was brought about by domestic fiscal and monetary expansion, and appropriate trade and exchange rate policies abroad, all of which reinforced the spontaneous restorative forces of the economy (e.g. fall in prices and wages). These forces worked together harmoniously to increase aggregate effective demand.

This paper additionally notices that not only the size but the composition of the demand increase determines whether the resulting recovery would be sound and sustainable. Contemporary rhetorics abound in hailing digging ditches or vending apples as employment measures. It is doubtful that they could have cured so vast and structural a depression as actually occurred. At best, demand stimulus of the above kind is nothing other than an unemployment compensation, a mere transfer payment, which of course was tried by some governments.

We now confront a range of issues to be addressed, all of which can not be resolved in this paper adequately enough. What were the aggregate effects of expansionary fiscal and monetary policies if any and what were the transmission mechanisms? Which industries had desirable linkages with and repercussions on others and how did they fare in investment allocation? Which were the most depressed sectors and to what extent were these favored by specific policy measures? How did all these differ among the three countries concerned here?

The rest of the paper is organized as follows. The next section is devoted to delineate the macro policies and their performances in the U.S., Britain, and Germany. Section III introduces the idea of input-output analysis, and applies it to evaluate investment allocation in the recovery process in the three countries. The epilogue section is reserved for a glance at discussions of policy alternatives, and a call for further inquiries into the nature of the recovery from the Great Depression. While

the largely descriptive section II brings together existing literature for a comparative survey, which naturally assumes a major function of the paper, section III explores hitherto neglected aspects, the implications of the demand structure, or investment allocation, for the recovery process.

II. Policies and Performance

Standard accounts of U.S. recovery tend to attribute it to macroeconomic expansionary measures which purposefully increased effective demand. Fiscal policy, however, has been interpreted otherwise. In terms not of actual but of "full employment surplus," the U.S. government maintained a budget surplus through the 1930s. It was not that recovery effects of deficit spending were insignificant "because it did not work, but because it was not tried." (Brown 1956, p.863)[4] Public works undertaken by the federal government were even said to have caused misallocation of resources due to their implicit connection to political interests (Wright 1974, Anderson and Tollison 1991).

Positive evaluation seems to dominate in the realm of the monetary sector. Although there stands a strong criticism that the Federal Reserve was passive in expanding the reserve base by open market purchase or cut in rediscount rates (Friedman and Schwartz 1963, pp.511-514), it is undeniable that the money stock (M1) increased by about 10 percent per annum between 1933 and 1937. The observed rapid and continual increase of the money supply was due to the expansion of the monetary base at the annual rate higher than 10 percent, considering the fall of the money multiplier after the banking crisis of early 1930s. Despite the absence of active Federal Reserve measures, the money base accumulated through the gold inflow accompanied by the devaluation of dollar in 1933 and through the capital flights from politically unstable European countries.

Increased supply of money resulted in the fall of nominal interest rates: the commercial bill rate dropped from 2.6 percent to 1.3 percent in 1933, and to near zero in 1934; bond yields, though different by credit rating, from about 4.5 percent to 3.2 percent. Transmission from monetary expansion to effective demand needs a signal, which is the *ex ante* real interest rate. The gap between the latter and the *ex post*

nominal rates quoted above is bridged by expectations over price changes, although the relation has yet to be established theoretically. According to a recent estimate, *ex ante* rates show a steep decline in 1933 and continuous decrease to negative values until 1937.[5] This stimulated the demand for fixed investment and durable goods which led the recovery, pushing demand for other consumptions and services to a later period. It is even contended that insofar as the effective demand stimulus came not from fiscal expansion but from increase in money supply, the impact of the war worked more through the capital inflow from Europe rather than through armament expenditure (Romer 1992).

A note on New Deal policies is in order. It is common practice to divide these policies into three categories: relief, recovery, and reform. Although opinions differ, it can be argued that the relief measures at least accomplished their immediate objectives, the New Deal reforms had lasting effects, but recovery efforts were not very successful. The National Industry Recovery Act (NIRA) is a case in point. This stipulated reduced workweek of 35-40 hours, a minimum hourly wage of 40 cents, improved labor conditions, protection of less skilled aged workers and youths, and regulation of child labor. In the circumstances of economy-wide depression, these measures only pushed up the labor costs, by raising unskilled wage, and by employing more inefficient workers to make up for reduced working hours. It is estimated that these increases in NIRA wages could account for as much as 5 percentage points of the unemployment rate during the two years of NIRA (Weinstein 1980, ch.4). Another example of controversial policy was the Agricultural Adjustment Act. This pursued a credit control to reduce the acreage of cultivation in order to solve the problem of overproduction. It aggravated industrial recession, however, by driving sharecroppers into the urban wage labor market, and thus exposed long repressed social problems (Whately 1983).

New Deal was regarded by many as a turning point to the recovery phase (Chandler 1970, ch.8, Fearon 1987, pt.3), but individual measures seem to belie this story. Here, a rather unconventional hypothesis was rendered recently. The New Deal was a "regime change" which broke away the expectation that the depression would continue. Inconsistencies in policy measures notwithstanding, New Deal

revived business confidence, and induced a rise in investment spending (Temin and Wigmore 1990). The New Deal also significantly increased the size of the government budget, and the share of federal, as opposed to state and local, governments. Emergency measures against the depression pushed up expenditures explosively, and the total governments' share in the national product increased continuously thereafter (around 12 percent in the 1920s; over 20 percent in the New Deal years. Wallis 1985). Undeniably the concept was established that the federal government is responsible for the stability of American economy and society.

Explanations of British recovery are multifaceted. Counted as contributing factors are: off-gold and devaluation of pound sterling in 1931, cheap money and interest rate decline stimulating investment, the General Tariff of 1932 and regulation of long term capital export, business optimism about return to investment, housing boom, rapid growth of "new" industries such as electricity, chemicals and automobiles, and armament expenditure from 1935 on (Winch 1969, Alford 1972).

Let us examine macro policies first. John Maynard Keynes, who actively participated in the Macmillan Committee of Finance and Industry, already in 1930 emphasized the need of public works to stimulate effective demand. But the Treasury discipline of balanced budget militated against deficit spending, and government expenditure moved not in a compensatory, but in a pro-cyclical manner. The share of government in the national product actually fell until 1935. Fiscal policy, then, did not play any role in British economic recovery (Richardson 1967).[6] In terms of "constant employment budget," a surplus accumulated in accelerating speed from the onset of the depression to 1933-34, when the surplus began to decrease and turned to deficit only with the massive rise in rearmament spending (Middleton 1981). But it has been pointed out that in order to create effective demand sufficient to absorb more than 3 million unemployed, there needed to be so high a level of deficit spending that was politically and administratively impossible for the government, which was already suffering huge public debt, no matter how big a value for the multiplier one may assume. It is also doubtful whether the multiplier effect would have fallen on the sectors or regions where the depression was most severe (Glynn and Booth 1983).

The second proposal of Keynes to the Macmillan Committee, which was accepted, was the protective tariff, aimed at improving the balance of payments and the terms of trade. Nearly a hundred years of the free trade ideal was replaced by protectionism to stimulate effective demand and employment. The General Tariff of 10 percent was levied on almost all manufuctured imports in 1932, and the rates were raised for many items thereafter. While the protective tariff diverted imports to less efficient Commonwealth countries and provoked retaliatory measures by trade partners, it reduced total volume of imports substantially. Demand for domestic products expanded; investment increased in protected industries. Coupled with the devaluation of the pound sterling, it lowered the propensity to import manufactures and heightened the competitiveness of import substitution industries. Some even attribute more weight to the tariff than to the devaluation in this regard (Kitson and Solomou 1991, ch.4). The tariff also reallocated resources from less protected sectors to more highly protected sectors. The "effective rate of protection" estimates show that textiles, automobiles, chemicals, nonferrous metals, glass products were more, and iron and steel, shipbuilding, plate glass, electricity were less protected (Capie 1978).[7)]

Frequently counted as the most important policy decision concerning economic recovery was the abandonment of the gold standard, although it was forced by circumstances unlike the case for the U.S. The floating exchange rate system was adopted in September 1931, and the pound sterling was allowed to depreciate, resulting in less import and more export and employment. Free from the burden of the sterling parity maintenance, monetary policy now could be used solely for domestic purpose. Interest rates were lowered to provide "cheap money." This was in part to ease government debt service, a traditional Treasury attempt to keep the budget balanced, but the monetary ease certainly facilitated industrial recovery. The Bank rate dropped from 6 percent in February to 2 percent in June 1932, and remained at the level until 1939. Short and long term interest rates followed suit in turn, to stimulate business investment, which was reinforced by recovered expectation over the return to investment.

Interest rates on new loans of building societies also fell, helping to bring about

a housing boom. The surge in residential construction is often given particular emphasis. It was estimated that 17 percent of growth of the gross domestic product between 1933 and 1934 was attributable to the housing boom, and 30 percent between 1932 and 1935 if secondary repercussion was accounted for (Worswick 1984). But the building activity was largely limited to the South, East, and Midlands, the bedsides of "new" industries, giving less stimulus to the more severely depressed regions of the North and Wales where staples like coal, textiles, iron and steel, and shipbuilding were in distress.

This might have reflected the rapid growth of new industries such as automobiles, chemicals, and precision machinery, which sometimes were claimed to have led the recovery (Richardson 1962, Aldcroft 1986, ch.6). These new industries represented less than 20 percent of the British economy by then, however. They are likely to have received too much emphasis (Buxton 1975, von Tunzelman 1982).

In the case of Germany, the picture is somewhat different, because there are debates on whether to relate the recovery to the political change of January 1933, the coming of the National Socialist government. Examination of effective demand conditions in standard order, however, would serve our purpose. The main explanation for expansion of demand after 1932/33 lies with the increase in public expenditure and policies designed to stimulate investment.[8] Following the initiative and example of the former governments (Schneider 1986), the Nazis adopted a strategy to heighten the level of direct state expenditure on industrial investment, construction and employment programs (see Table 2).[9] In addition, the government sought to facilitate and control private investment activity in a number of ways, such as through contract grants, tax concessions, and policies to restrict dividend payments.

The increase in public spending was, here again, subjected to formal analysis in terms of "high employment budget" concept. Cohn(1992) estimated the high empoyment surplus to find that "fiscal policy became more expansionary every year starting 1933. ... fiscal policy did not turn toward expansion until Hitler came to power" (p.335). Although work creation programs and later rearmament expenditures contributed to ever growing government spending, however, the movement was

toward "less restriction," and "fiscal policy was almost certainly still restrictive overall" until 1935 (p.337 and his Table 4).[10] Though government spending rose continually under the Third Reich it remained approximately constant as a share of national product, fluctuating around 30 percent, similar to the percentages in the years 1930-32 (Table 2). Tax rates barely changed from the level of the Bruening years; tax concessions stimulated business in limited, if important, sectors. The deficits were always rather conservatively funded, and about 80 percent of the non-regular Reich expenditure between 1933 and 1939 was financed by taxes and long term borrowing. "Thus the state was happy simply to take its share in the German recovery when it took place" (James 1986, p.372).[11]

As the structure of the government spending in Table 2 shows, it was not that the "pump priming" of work creation measures led the recovery but that the aggregate effect, if any, of all government spending including rearmament, construction and *Motorisierung* attacked the recession on a broad front. The implications of the composition of the public spending will be discussed in the next section; I presently turn to policies affecting private investment.

If the currency devaluation allowed the United States and Britain to turn to expansionary policies at home, Germany opted for exchange controls instead to isolate her economy from outside. The solution of the reparations problem in 1932 provided more room for maneuver as well. Germany at long last did not have to contain herself in the involuntary restrictive trap. However, monetary expansion or cheap money did not follow immediately. The Reichsbank was until October 1933 legally prohibited from rediscounting government bills, or from open market purchase. Even thereafter, the Reichsbank did not engage in active open market operations, but limited its activities to discounting disguised form of government debts, the tax certificates (*Steuergutscheine*), and the so-called Mefo-bills, which duty it has assumed since 1932 so as to circumvent the litigation.[12] Whatever the amounts that the central bank money was increased, liquidity was largely restored in banking and industry, as the rediscount rate was lowered from 7 percent to 4 percent in 1933 alone, with the result of a decline in short term interest rates. In contrast to the comparatively lower rates in the money market (call rates fell from 6.4 percent in

1932 to 2.9 percent in 1936 (Deutsche Bundesbank 1976, p.278)), the yield of fixed interest securities remained high until the "4 percent conversion" in April 1935, when this time the issue of new industrial bonds and shares was restricted to promote the public bond market. The long term capital market was under prolonged stagnation, and industrial finance had to be dependent on retained profits, which was in sharp contrast to the case of prewar years (e.g. Guillebaud 1939, ch.2).

This idiosyncrasy is evident from Table 2. Whereas the Reichsbank credit increased by 80 percent from 1932 to 1936, the credit of the credit system as a whole rose only by 19 percent. The inherent role of the banking sector in liquidity creation remained "frozen" in the aftermath of the banking crisis of 1931 (Irmler 1976, p.325). The long run demise of German credit banking in its normal function was well documented: "the banks were cut off from their customary connections with trade and industry and were changed into agencies for absorbing and holding the public debt" (Wolfe 1955, p.401, Hardach 1984, Balderston 1991).

Monetary ease substantially increased private sector liquidity, however, and the lower interest rates reduced industry's cost of debt service and therefore, indebtedness. Together with government's tax concessions(including notoriously generous depreciation allowances), price and wage controls, and 6 percent ceiling on dividend payments, it elevated private firms' profit potential and thereby promoted self financed investments, though favors were given to certain sectors. For industries directly related to the rearmament and the autarkic effort, new investments were financed virtually by "derived public financing" (Lurie 1947, p.221).

The unconventional stimulus given to private investment in Germany may have been made successful by psychological factors of optimism, or by a change in the "policy regime" in 1933 (Fischer 1968, p.66, Temin 1989, ch.3). According to the other extreme, economic recovery was largely spontaneous, and Hitler's regime hindered an otherwise sound, "normal" cyclical upswing, or "far healthier growth" (James 1993, p.81, Buccheim 1994, p.111). The evidence the latter claim referred to was the consumption boom of the late 1933 and early 1934. But it seemed to have lasted only a short while, and to evaporate altogether when one only looks at yearly data of private consumption as a share of national product (88.5% in 1932, 80.5% in

1933, and 76.6% in 1934. Hoffman 1965, p.826). The improvement of firms' cost structure which was cited as having heightened liquidity and profit potential may merely have reflected various policy measures.

The experiences of the three countries examined taken together indicate that external constraints on expansionary policies were removed either by devaluation or exchange control, and that investment led the way to recovery, and, aided by various policies, reinforced the natural tendencies of the business cycle to turn upward. These investments were put through in construction and industry, including durable goods (classified as consumption simply because of accounting practice while residential construction counted as investment), both by the private sector and by government. Timing, intentions, and the substance of policy measures differed by country, and together with differences in the nature of the depression, resulted in diverse recovery patterns. Allocation of investment over industries, among others, is to be examined in the next section.

III. Investment Allocation

The increase in investment demand in a certain industry sector not only generates production and employment in that particular sector but also brings about such increases in related sectors by repercussion. For example civil construction stimulates production of steel plates, cement, and lumber, and steelworks in turn demand more iron ore, coke, and lime, and so on. The total production thus generated by one unit of final demand in a sector is called sectoral multipliers, and this measure indicates how effective a particular investment is in raising industrial production in general. The systematic way to estimate these multipliers is provided by an input-output table, each figure in the table showing the value of goods and services originating in the sector specified by the row and directed to the sector specified by the column. Normalized into unit value of production for each sector specified by the column, this gives an input-coefficient matrix, A, and then the "Leontief inverse," $(I-A)^{-1}$, can be obtained. Formally, the sectoral production multiplier for a sector(j) is the column sum($\sum_i r_{ij}$) of the elements of the Leontief inverse, each element(r_{ij}) of which indicates the total production both directly and

indirectly generated in the sector specified by the row(i) by a unit increase in the fianl demand in the sector specified by column(j), thus summing up the total production generated in all industry sectors. The employment multiplier can be computed as the column sum($\sum_i r_{ij}l_i$) of the product of each element of the inverse matrix(r_{ij}), and the labor coeffient(l_i), labor input in man year per unit value of production, and indicates the total labor demand generated by a unit increase in the final demand in the sector(j).

Results of computation from the U.S. table for 1939 and the British table for 1935 (Leontief 1951, Barna 1952) are shown in Table 3, with production and employment multipliers for 24 aggregated sectors, and the Leontief inverse matrices in the Appendix.[13] An input output table for the German economy in the 1930s is not yet available, however, that the formal discussion starts with the other two countries. For convenience, below discussion will be limited to the production effects, while the employment effects are easy to analyze in the like manner. In Britain, multipliers were relatively high in old staples like textiles, iron and steel, and shipbuilding, and low in new industries except automobiles. In the U.S., coefficients were high in new industries such as chemicals and nonferrous metals besides automobiles, as well as in textiles, leather, and food industries. A simple average of all sectors indicates that interindustry relations were more intense, thus the total impact of an initial injection of expenditure into a particular industry was greater in the U.S. This is in part explained by the higher import dependence of the British economy at the time, a tendency to spread secondary production effects abroad to a greater extent.

These sectoral multipliers can be utilized to evaluate the investment allocation during the recovery from the depression. Data on investment by industry from Bernstein(1987, pp.115-8) and Feinstein(1965) were reclassified appropriately and those for, say, 1935 were put against production multipliers in Figure 2. The correlation between the two was noticeable in the U.S., while it does not appear to have been so high in Britain.[14] This implies that investment in Britain was not allocated in a manner to maximize total production effects. Considering the high value of multipliers in old staples in Britain, and the long term tendency of investment shift to

new industries in general, this may look natural. Alternatively, in the short run, specific incentives were not sufficiently given to raise rates of return in high multiplier sectors on the one hand, the mobility of resources may have been less than adequate to allow appropriate investment allocation to take place on the other. The latter factor was often designated as a characteristic of the British economy, namely that the depression was structurally concentrated in old staples and in certain geographic regions.

Another, probably more meaningful in the short run context, way of assessing the effectiveness of investment allocation for the recovery is to look at the interindustry relations more closely, to see whether a large expenditure was put to sectors whose indirect effects fell on more severely depressed industries. Direct measures of relief and rationalization efforts were tried on those sectors in relatively more severe distress, without much productive effect. It is worth investigating the demand stimulus given by investments in other sectors to those heavily depressed industries.

The construction sector is a case in point. One has to keep in mind here that multipliers for the construction sector were estimated to be above average for the two countries, but not very high. Public works undertaken by the New Deal authorities showed mixed performance. Among the major victims of the depression in the United States, they had certain secondary effects on nonmetallic minerals, lumber, iron and steel, while there was a negligible impact on textiles, coal mining, and automobiles. The housing boom in Britain stimulated indirectly the same nonmetallic minerals, lumber, iron and steel, but these sectors, except iron and steel, were under relatively moderate stagnation in Britain. Far less impact was given to the industries in severe distress such as textiles, coal minining, and shipbuilding.[15] Although the input output inverse matrix shows a high degree of repercussion from construction (including civil and nonresidential) into the iron and steel, considering that the residential buildings consumed less of steel frames by then,[16] except for the tertiary and more remotely indirect effects the actual stimulus may have been much smaller than indicated by the coefficient. Therefore one can conclude that the housing boom was less effective than often claimed in leading the recovery from

such a structural depression.

In order to encourage recovery of the more heavily depressed sectors such as, say, coal mining in Britain, demands need to come from iron and steel, chemicals, machinery, and railroads, and that of, in turn, say, iron and steel, demands from shipbuilding, machinery, and automobiles.[17]

It is unfortunate that input output table for Germany in the 1930s is not yet available.[18] It is not impossible, however, to conjecture the impacts of investment allocation as such on total industrial production.

As to the general investment allocation in manufacturing and mining, although private amounts were relatively small, major investment funds went into those sectors in which U.S. and British tables suggest higher multipliers. During the mid 1930s investment concentrated on heavy and chemical industries, followed by machinery, automobiles, and electrical engineering, with some weights in building and textiles.[19] Definite assessment would remain questionable until more information on interindustry relations is available. But fragmentary evidence as we have indicates that the overall investment pattern observed was in the direction of facilitating economic recovery. It will have to suffice here to take a look at two most important (see Table 2), and frequently discussed areas, motorization and rearmament.

Though hardly innovative on its own, *Motorisierung*, a policy to encourage road-buildings and car production, was one of the prime projects of the Nazi government. Road repairs and road building constituted the bulk of public investment. The majority of public money under the headings of transportation and work creation in Table 2 went into motor-roads. In addition, although the state did not directly participate in the automobile industry, special tax incentives were given to car purchasers as well as to car manufacturers. Combined with other favorable demand and supply conditions, it helped raise the index of car production from 100 in 1932 to 250 in 1934 as against 140 for all industry. More importantly, the motor industry has "peculiar diverse backward and forward linkages" to give sustained effects on recovery. Immediate effects were increases in steel orders, orders for manufactured goods such as lamps, textiles, machinery and tools, in tyre and rubber, fuel industries, retail and repair shops, garages, and roads.[21] "It is regarded

increasingly, and was at the time, as a 'leading sector' in its own right" (Overy 1975, p.482).

German rearmament did not get fully under way until 1935-36, a fact that many who underrate the role of military expenditure in economic recovery rely on. Though limited in scope and openness, however, armament expenditure was substantial even before, if Mefo-bill estimates were added. (Table 2) Moreover, its "effect on specific sectors is also critical for an overall analysis of the economic consequences. Expenditure on armament meant orders for engineering works" (James 1986, pp.383-4), and aircraft and shipbuilding industries, all calling for additional investments in heavy industry, including metal mining and steelworks.

Construction expenditure including work creation programs is again worth examining. As noted above for the experience of the U.S. and especially of Britain, the construction sector did not tend to generate much repercussion to other industries by that time.[20] German construction programs were subjected to criticism as well. "They provided few orders for established engineering firms, and posed instead considerable labor problems." Workers had to be taken away from their homes, with wages lower than those of unskilled female textile workers (James 1986, p.384). One peculiar circumstance, however, favored construction investment in Germany. That is, building costs declined as fast as the general price level and remained low, while in other countries it has fallen less than average wholesale prices. This may imply that the German construction industry was not "out of adjustment" (The index of building costs with 1928-30 as 100 declined to 73 in 1933 in Germany, whereas only to 91 in the U.S. and to 89 in Britain, respectively. Poole 1939, p.200). A comparatively cost efficient sector, if found in depression, has the potential to generate larger economy-wide repercussion when given preferential incentive measures, without risking unnecessary dislocation in the industry structure (ibid. pp.191-211).

To summarize, in terms of overall interindustry relations the U.S. had a potential of an initial expenditure in a particular sector giving greater spillover effects than Britain. Specifically, investment was allocated relatively more in high multiplier sectors in the U.S. than in Britain. Secondary impacts did not fall very much on more severely depressed industries, especially in Britain. Fragmentary evidence

suggests that such pronounced expenditures as in construction, motorization and rearmament were likely to have brought about much higher repercussion effects in Germany.

IV. Better Alternative?

Scholars endeavoring to clarify the nature of the recovery are overtly or unconsciously engaged in a counterfactual exercise. They must hypothesize better policy alternatives and estimate their probable effects. By now the view is widespread that earlier abandonment of the gold standard, relaxing individual countries' external constraints, would have made it possible to prevent the spread of the deflation in the U.S. to Europe or to initiate earlier recovery from the Great Depression (Eichengreen 1992b). The absence of countercyclical Federal Reserve action, the Treasury's failure to adopt Keynesian deficit spending, the Reichsbank's reluctance to devalue the Reichsmark, these have all long been blamed.

Some of recent works on alternative recovery measures tend to assume a more conservative posture. If the pound sterling had been devalued earlier, it would not have helped a British recession of a structural nature much more than the devaluation of 1931, and might have risked inflation (Wolcott 1993, also see O'Brien 1987). Germany had little room for maneuver either to devalue or to increase deficit spending, which may not have initiated early recovery anyhow (Borchardt 1982, ch.9, 1984).[22] These arguments, however, were not presented to deny that the turn of the policy perspective to expansionism in Britain in 1931 and Germany in 1932/33 was in the right direction.

More noteworthy is a study on investment allocation in Britain. In his study of British rearmament in the late 1930s, Thomas(1983) argues that not only did military expenditure create enormous employment, but that the major beneficiaries of the enhanced defense budget were iron and steel, coal, and engineering, which were in severe distress. This led him "to view the eschewment of fiscal policy in the thirties as a missed opportunity for the economy." The major advantage of rearmament over an alternative public works strategy appears to have been "its strong linkages to the staple industries" (pp.571-2).

Aside from speculations on alternative policies, it now comes to the fore that investment allocation was less effective for Britain than for the United States to fight the depression, and perhaps far less than for Germany. Whether the stimulus was given by cheap money or fiscal incentives, investments were not put through sectors most appropriate to sustain the recovery, into industries with higher multipliers, or with greater indirect impacts on acute sufferers. This incongruous pattern of resource allocation was shown to have been less problematic in the U.S., and especially in Germany, if partly because the depression had a less "structural" character and the construction sector was under more favorable conditions. It is to these features that this paper calls particular attention. The magnitude of the probable effects of the alternative investment allocation could be computed using the figures in the Leontief inverse (following examples set by, among others, Thomas 1983, and Leontief 1986), but the task of setting up reasonable counterfactual may well belong outside the scope of this paper.

It is a standard argument that allocation of investments is always better assessed in long term perspectives. Long run growth and stability of the economy, and the living standard of the population, must come first as criteria for "sound" allocation. One must keep in mind, however, that in the era of the Great Depression of the 1930s, the shorter run objective of boosting industrial production, if not mere "employment", was at issue. Allocation of resources to this end, especially when it came about through direct supervision from above, may be bound to culminate in dire bureaucratic inefficiencies and a stagnation in the quality of consumer goods, as in the case for Germany.[23] It appears that the short run objectives were in conflict with long run goals.

Unfortunately, however, the recovery in the U.S. and Britain remained slow and incomplete until the outbreak of World War II, when the two countries were forced to drive to the war economy.[24] The fact that economic prosperity was regained in this manner almost displaced all opportunities for searching for an industrial structure and technological change suitable for peace time.

Notes

1. Notable examples of international comparison of the recovery process include DIW(1984), Temin(1989, ch.3), and Garside(ed. 1993).

2. This is based on unemployment statistics of 1933 by industry. U.K. *Ministry of Labour Gazette* (1933), pp.256-257, 414-415; *Statistik des Deutschen Reichs* (1933), p.2. See Balderston(1994), p.3, Table 1.2. The statistics for the U.S. can be found in U.S. Bureau of the Census, *Abstract of the 15th Census*(1933), pp.478-482. See also U.S. Department of Commerce, *Survey of Current Business*(1934), various issues.

3. While registered unemployment declined from 6.0 million in January 1933 to 3.8 million in January 1934, one estimate (by Willi Hemmer in 1935) of the total unemployment, including "invisible", and "quasi-" unemployments, indicates a much slower decrease, from 7.6 million to 6.0 million. Buchheim (1994), p.106.

4. Simply, full employment budget tells us what government expenditures and tax receipts would be if the economy were at full employment. Lower transfer payments and higher tax yields are of course expected than in actual budget. Peppers(1973) revised the computation and went further in the similar conclusions, but Renaghan(1988) employed a "weighted standardized surplus" concept to point out that the above results were overstated.

5. This method was designed, among others, by Mishkin(1981). The gap between the *ex ante* real rate and the *ex post* nominal rate is correctly identified to be equal to the unanticipated inflation. The *ex ante* real rates were then estimated as the fitted values of the regression of the *ex post* real rate on current and lagged variables capturing monetary and industrial information. For recent estimates, see Romer(1992, her Figure 8, p.778).

6. The Treasury view focused on the probable crowding out effect of government expenditure, but in addition it contended that a balanced budget was necessary to maintain government credibility and to promote business confidence in the private sector.

7. Kitson, Solomou and Weale(1991)'s result is somewhat different. Iron and steel was substantially protected, and aircraft, liquors, tobacco were among less protected.

In case of the United States, analyses abound on the Smoot-Hawley tariff of 1930, widely known as a beggar-thy-neighbor policy. Its relation to the recovery, however, was given little attention, and most likely was less pronounced because of the lower import dependence of the U.S. economy. For estimates of effective protection, see Hayford and Pasurka(1991), and Kim(1994).

8. Henning(1973)'s data show a definite sign of recovery by the summer of 1932, which suggests that the turning point came with the Papen cabinet, which launched the work creation programs and especially, the tax reliefs. This recovery was only partial and "aborted," however, and the economy fell back to its low point shortly. (See Temin 1989, p.102) Controversy over the turning point is less of a concern here.

9. Overy(1982) often contradicts himself in statistics. Especially his tables 10, 12 and 13 defy simultaneous interpretations, and his tables 8 and 9 are more doubtful, not to mention his own explanation of his table 8 (p.35). I gave here in Table 2 figures which are in themselves consistent, and even in case they are incorrect, would not harm any logic in the text.

10. A more recent computation of "full employment budget" for the years 1925-1934 also indicates continuous surplus during the 1930s (Tilly and Huck 1994, p.86).

11. Here, James seems to have underestimated the effects of the specific tax concessions designed to stimulate employment. For trends of the Nazi tax policies, see, e.g., Henning (1994).

12. A major part of the work creation programs was financed through the tax certificates (*Steuergutscheine*) which might be used in the future to pay certain Reich taxes, and which were in the meantime discountable by the banking system. The Mefo (*Metallurgische Forschungsgesellschaft mbH*) was an institution set up by the government that purchased armaments and paid for them by issuing interest-bearing bills, which could then be discounted by the Reichsbank. The accumulated amount of the Mefo-bills was estimated to be about 5 billion RM for 1932-1935.

13. The "closed" model of the U.S. table was converted to "open" model by exogenizing final demand sectors. Both the 42 sector U.S. and 38 sector British tables were aggregated to common 24 sectors to make comparison possible. For

detailed procedure of conversion and aggregation, see Kang and Yang(1994).

14. Net investment series, which would be more appropriate for our purpose, are also available for Britain (Feinstein 1965). But since depreciation allowances made by book value rather than technically estimated physical deterioration seemed somewhat arbitrary, I chose gross investment for Britain, and later for Germany. See note 19 below. While they might not be directly comparable since the number of observations differs due to the nature of the data available, the correlation coefficients are 0.313 for the U.S. and 0.094 for Britain. The correlation analysis entails an aggregation bias. Big sectors tend to have larger amounts of investments, so to be located to the right; their repercussions tend to be internalized within their own, so to be located in low multiplier region. Small sectors tend conversely. The bias is in the negative direction, and reinforces the positive correlation observed for the U.S. International comparison may not be hampered by this bias very much.

15. This can be found out from reading the column 22 of the Leontief inverse matrix presented in appendix Tables A1 and A2. Each element shows the amount of indirect impact given to the respective sector by one unit of expenditure in construction, where the total figures, 1.8963 and 1.6071, appear in Table 3 in the text.

16. As in a description of the German situation, the depression dictated even the nature of the housing boom so that the demand for newly built dwellings had shifted to smaller ones and used more wood as against brick and steel (Poole 1939, p.193).

17. This can be read from the row 2 and row 5 of the inverse matrix, Table A2. Notice that row sums have no meaning.

18. Input output tables for Germany go back to year 1954, for 16 sectors (Mertens, Staeglin and Wessels 1965). For the U.S., a table was constructed for 1919 as well as one for 1929 (Leontief 1951); for Britain back to 1841 (17 sectors, Horrell et al. 1994), and for Japan, for 1935 (23 sectors, Nishikawa and Akimoto 1981).

19. Statistics can be found in *Statistisches Jahrbuch fuer das Deutsche Reich,* 1938, p.566, and 1940, p.584.

20. It may be worth pointing out that although construction industry was customarily regarded as labor-intensive and more employment-generating than others, contemporary labor coefficients show this was not the case. For the U.S., it was

about one half the average, for Britain just around average in the 1930s (Leontief 1951, Chapman 1953).

21. Input output model considers only backward linkages. Recall here also that the value of multipliers for the automobile sector were high both in the U.S. and in Britain.

22. There is now an almost twenty year long debate on this point. See, among others, von Kruedener(ed. 1990), Holtfrerich(1990), and Buchheim et al. (eds. 1994).

23. These inefficiencies may have accounted for the apparent lag of productivity increase in Germany under the Nazi regime. Temin(1990) tried to relate the differential in productivity growth between the U.S. and Germany to the wage policies: high in the U.S., low in Germany. Since the "efficiency wage theory" is yet at a preliminary stage, his hypothesis, and others endeavoring to explain the productivity performances in the era, remain conjectural.

24. Even by 1940, the recovery was less than half-complete in the U.S., after when, World War II fiscal policies were "instrumental" in the restoration of full employment (Vernon 1994).

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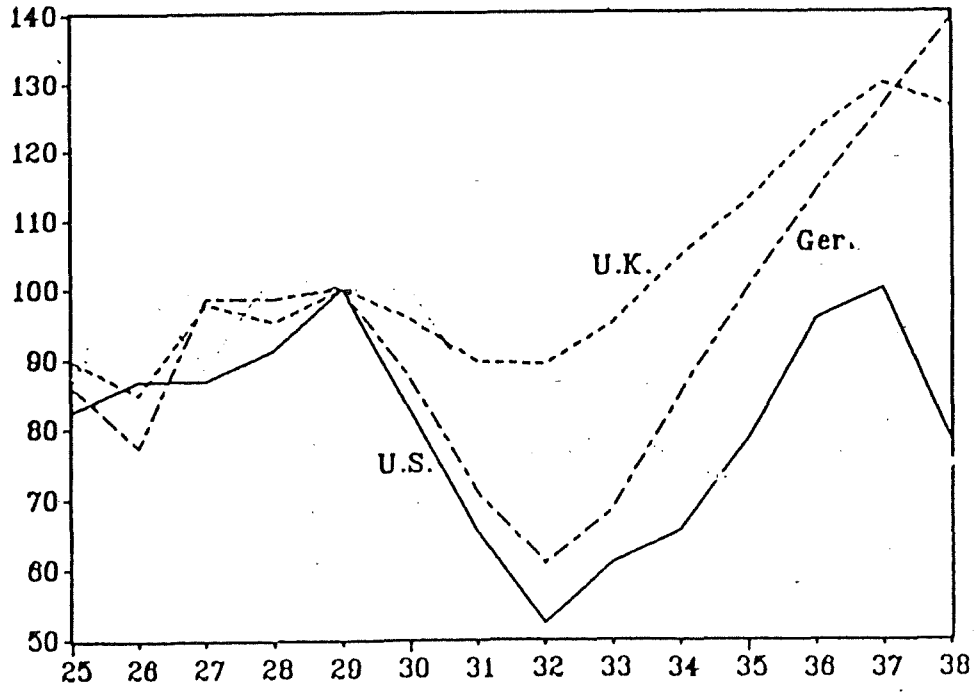
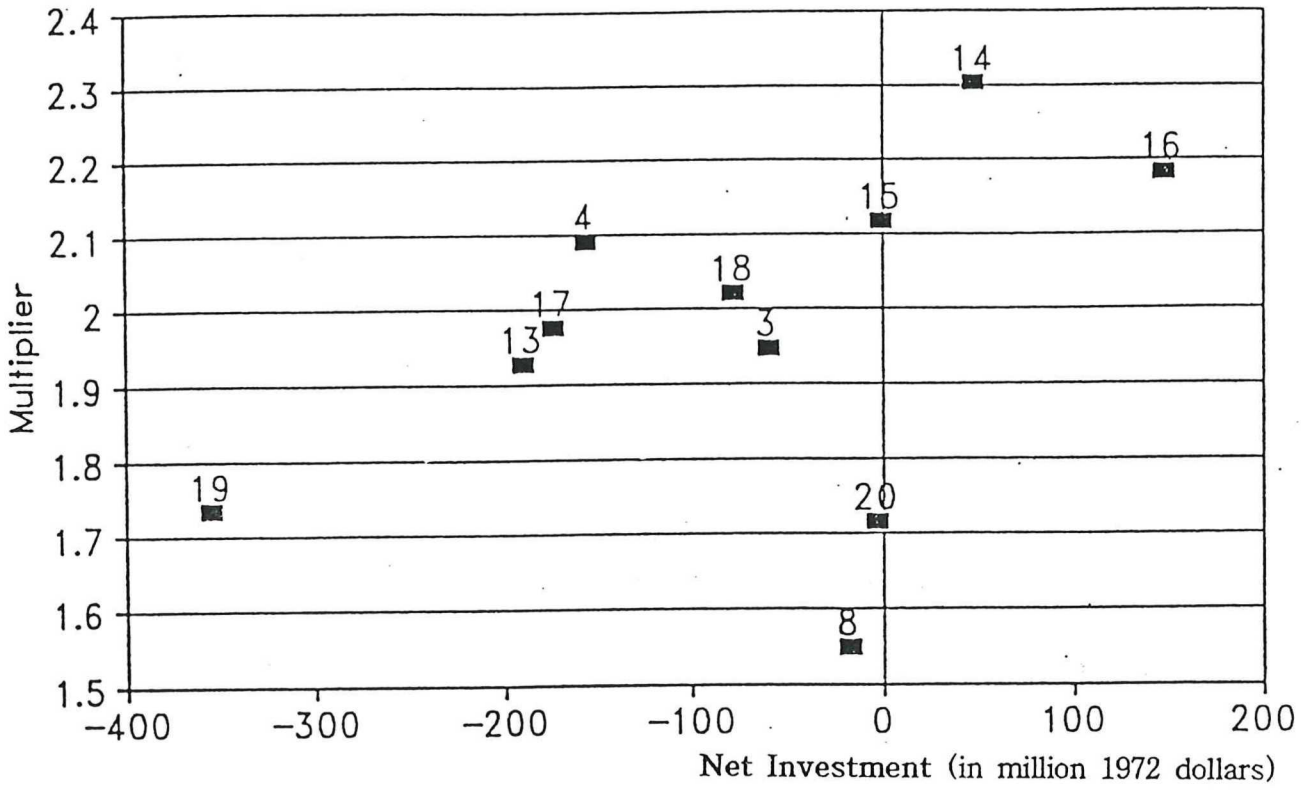
Figure 1. Industrial Production (1929 = 100)



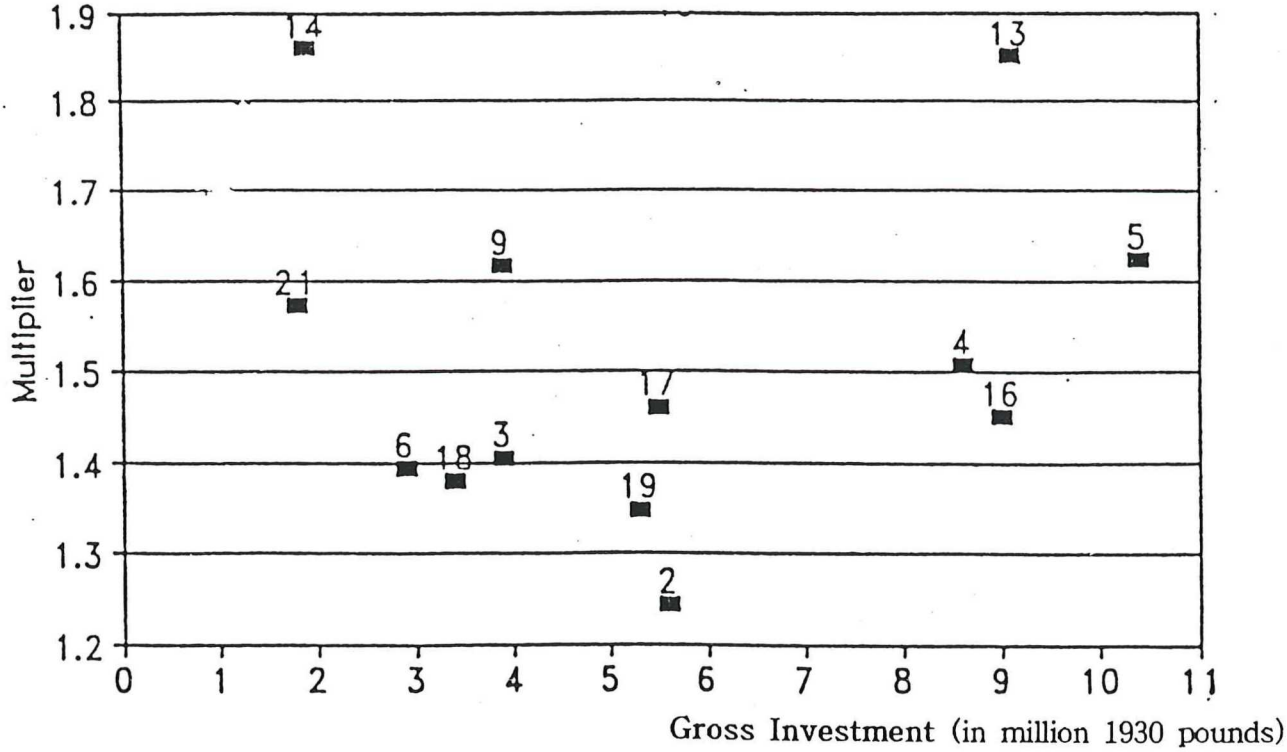
source: Temin(1989), p.2

Figure 2. Investment Allocation and Production Effects, 1935

U. S.



Britain



source: see text

note: numbers indicate industry sectors

Table 1. Unemployment Rates in Industry (%)

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
U.S.	5.4	6.9	5.3	14.2	25.2	36.3	37.6	32.6	30.2	25.4	21.3	27.9
Britain	9.7	10.8	10.4	16.1	21.3	22.1	19.9	16.7	15.5	13.1	10.8	12.9
Germany	8.8	8.6	13.3	22.7	34.3	43.8	36.2	20.5	16.2	12.0	6.9	3.2

source: Eichengreen and Hatton (1988), pp.6-7

Table 2. Public Expenditure, Investment and Credit in Germany (bil.RM)

	1928	1932	1933	1934	1935	1936	1937	1938
1) Public Expenditure total (all levels of government)	23.2	17.1	18.4	21.6	21.9	23.6	26.9	37.1
construction	2.7	0.9	1.7	3.5	4.9	5.4	6.1	7.9
rearmament	0.7	0.7	1.8	3.0	5.4	10.2	10.9	17.2
transportation	2.6	0.8	1.3	1.8	2.1	2.4	2.7	3.8
work creation	-	0.2	1.5	2.5	0.8	-	-	-
2) Private Investment in manufacturing and mining	2.6	0.4	0.6	1.1	1.6	2.2	2.8	3.7
3) Gross National Product	88.1	56.7	58.4	65.5	73.1	81.2	90.9	100.2
Reichsbank credit	2.9	3.4	4.0	5.0	5.4	6.1	6.6	9.4
Credit of all credit institutions	50.3	53.5	54.1	58.2	62.7	63.7	67.4	79.2
Reichsbank note circulation	4.9	3.5	3.6	3.9	4.3	5.0	5.5	8.2

source: 1). Overy(1982), p.50. 2). *Statistisches Jahrbuch fuer das Deutsche Reich*, 1938, p.564. 3). Deutsche Bundesbank(1976), pp.7,14,18.

Table 3. Sectoral Multipliers: U.S. 1939 and Britain 1935

	Production		Employment (man year)	
	U. S. (per 1000$)	Britain (per 1000£)	U. S.	Britain
1. agriculture	1.9037	1.5169	1.11	3.7
2. coal and coke	1.9768	1.2439	.45	5.3
3. other mining & nonmetallic minerals	1.9476	1.4057	.32	3.3
4. chemicals	2.0912	1.5079	.27	2.0
5. iron and steel manufactures	1.7919	1.6252	.34	1.9
6. nonferrous metals	2.1007	1.3948	.22	1.7
7. shipbuilding	1.6570	1.7575	.39	3.3
8. mechanical engineering	1.5493	1.6384	.29	3.6
9. electrical engineering	1.8538	1.6171	.32	3.5
10. motor vehicles	2.5616	1.8820	.35	3.2
11. aircrafts	1.5186	1.5245	.31	2.6
12. railroads	1.7233	1.6504	.31	3.0
13. textile manufactures	1.9276	1.8510	.51	4.1
14. clothing	2.3033	1.8609	.53	4.7
15. leather	2.1166	1.6754	.46	3.1
16. food industry	2.1833	1.4527	.52	1.6
17. wood industry	1.9768	1.4612	.49	3.5
18. paper	2.0216	1.3806	.34	1.6
19. printing and publishing	1.7340	1.3480	.34	3.1
20. rubber	1.7171	1.4665	.29	n.a
21. miscellaneous manufactures	1.6784	1.5731	,33	n.a
22. construction	1.8963	1.6071	.27	3.4
23. gas, electricity and water	1.5339	1.5464	.25	2.3
24. service	1.4489	1.2167	.36	3.0
average	1.8839	1.5502	.39	2.9

source: see text and appendix.

note: n.a. not available.

Appendix

Table A1. Leontief Inverse, U.S. 1939

		1	2	3	4	5	6	7	8	9	10
1	Agriculture	1.1119	0.0128	0.0080	0.0307	0.0061	0.0028	0.0046	0.0055	0.0085	0.0130
2	Coal & Coke	0.0059	1.1279	0.0621	0.0152	0.0249	0.0117	0.0121	0.0112	0.0102	0.0180
3	Other Mining & Nonmetallic Minerals	0.0302	0.0173	1.3157	0.0444	0.3112	0.0465	0.1422	0.0828	0.0656	0.1985
4	Chemicals	0.1071	0.0414	0.0786	1.2922	0.0501	0.0293	0.0461	0.0256	0.0485	0.0549
5	Iron and Steel Manufactures	0.0134	0.0080	0.0080	0.0179	1.0183	0.0038	0.0778	0.0465	0.0353	0.0998
6	Nonferrous Metals	0.0076	0.0052	0.0451	0.0223	0.0451	1.8358	0.0966	0.0277	0.0807	0.0568
7	Shipbuilding	0.0011	0.0009	0.0004	0.0007	0.0003	0.0001	1.0023	0.0003	0.0005	0.0006
8	Mechanical engineering	0.0463	0.0107	0.0150	0.0178	0.0127	0.0100	0.0682	1.0364	0.0140	0.0241
9	Electrical engineering	0.0037	0.0045	0.0034	0.0046	0.0031	0.0017	0.0091	0.0020	1.1403	0.0285
10	Motor Vehicles	0.0217	0.0023	0.0012	0.0022	0.0009	0.0004	0.0004	0.0009	0.0013	1.4339
11	Aircrafts	0.0002	0.0004	0.0002	0.0003	0.0001	0.0001	0.0001	0.0001	0.0002	0.0003
12	Railway	0.0016	0.0022	0.0011	0.0017	0.0009	0.0003	0.0003	0.0008	0.0012	0.0016
13	Textile Manufactures	0.0074	0.0013	0.0014	0.0024	0.0016	0.0011	0.0114	0.0023	0.0023	0.0245
14	Clothing	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003
15	Leather	0.0019	0.0003	0.0002	0.0008	0.0002	0.0001	0.0002	0.0008	0.0002	0.0017
16	Food Industry	0.0765	0.0225	0.0115	0.0238	0.0090	0.0037	0.0040	0.0087	0.0129	0.0170
17	Wood Industry	0.0167	0.0062	0.0044	0.0094	0.0056	0.0018	0.0084	0.0059	0.0171	0.0115
18	Paper	0.0087	0.0111	0.0190	0.0176	0.0116	0.0075	0.0048	0.0081	0.0144	0.0113
19	Printing & Publishing	0.0108	0.0185	0.0092	0.0145	0.0072	0.0029	0.0030	0.0070	0.0104	0.0135
20	Rubber	0.0068	0.0014	0.0008	0.0019	0.0006	0.0003	0.0030	0.0070	0.0021	0.0516
21	Miscellenous Industries	0.0044	0.0068	0.0035	0.0056	0.0031	0.0011	0.0300	0.0047	0.0066	0.0076
22	Construction	0.0517	0.0436	0.0347	0.0751	0.0241	0.0153	0.0220	0.0208	0.0258	0.0344
23	Gas, electricity and water	0.0095	0.0194	0.0215	0.0099	0.0163	0.0268	0.0127	0.0127	0.0108	0.0130
24	Service	0.3583	0.6121	0.3027	0.4803	0.2389	0.0975	0.0979	0.2314	0.3447	0.4453
	Sum	1.9037	1.9768	1.9476	2.0912	1.7919	2.1007	1.6570	1.5493	1.8538	2.5616

11	12	13	14	15	16	17	18	19	20	21	22	23	24
0.0035	0.0054	0.1511	0.0753	0.0412	0.3317	0.0509	0.0592	0.0135	0.0178	0.0151	0.0166	0.0043	0.0225
0.0035	0.0151	0.0131	0.0087	0.0082	0.0093	0.0111	0.0333	0.0089	0.0113	0.0071	0.0158	0.0922	0.0082
0.0207	0.1674	0.0153	0.0167	0.0173	0.0347	0.0627	0.0297	0.0115	0.0187	0.0184	0.2777	0.0338	0.0256
0.0915	0.0491	0.1708	0.0586	0.0525	0.0617	0.0577	0.0707	0.0472	0.0728	0.0507	0.0789	0.0514	0.0457
0.0200	0.1126	0.0070	0.0086	0.0110	0.0263	0.0286	0.0062	0.0038	0.0058	0.0103	0.0918	0.0130	0.0116
0.1438	0.0451	0.0056	0.0053	0.0039	0.0082	0.0057	0.0048	0.0067	0.0040	0.0468	0.0396	0.0415	0.0055
0.0001	0.0002	0.0005	0.0008	0.0006	0.0009	0.0006	0.0005	0.0002	0.0005	0.0005	0.0002	0.0001	0.0016
0.0262	0.0539	0.0279	0.0189	0.0154	0.0218	0.0117	0.0237	0.0283	0.0213	0.0047	0.0491	0.0132	0.0100
0.0057	0.0017	0.0027	0.0036	0.0029	0.0035	0.0030	0.0029	0.0015	0.0029	0.0027	0.0319	0.0335	0.0068
0.0003	0.0007	0.0038	0.0031	0.0022	0.0077	0.0023	0.0022	0.0008	0.0016	0.0015	0.0012	0.0010	0.0041
1.0542	0.0001	0.0002	0.0003	0.0003	0.0003	0.0002	0.0002	0.0001	0.0002	0.0002	0.0001	0.0001	0.0002
0.0003	1.0006	0.0011	0.0019	0.0015	0.0017	0.0014	0.0011	0.0005	0.0013	0.0012	0.0005	0.0001	0.0040
0.0008	0.0027	1.1728	0.3491	0.0152	0.0061	0.0230	0.0164	0.0052	0.0738	0.0109	0.0028	0.0006	0.0023
0.0000	0.0000	0.0000	1.0791	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0002	0.0011	0.0038	1.3120	0.0008	0.0012	0.0003	0.0025	0.0003	0.0014	0.0002	0.0001	0.0006
0.0034	0.0066	0.0268	0.0253	0.1192	1.1236	0.0172	0.0189	0.0071	0.0151	0.0137	0.0065	0.0041	0.0408
0.0037	0.0252	0.0069	0.0064	0.0090	0.0096	1.2374	0.0048	0.0023	0.0043	0.0072	0.0951	0.0109	0.0098
0.0030	0.0058	0.0130	0.0164	0.0162	0.0278	0.0111	1.3586	0.2434	0.0133	0.0206	0.0126	0.0040	0.0186
0.0024	0.0052	0.0089	0.0156	0.0126	0.0132	0.0118	0.0096	1.1684	0.0114	0.0099	0.0045	0.0031	0.0337
0.0041	0.0229	0.0019	0.0033	0.0172	0.0030	0.0012	0.0017	0.0011	1.0185	0.0018	0.0011	0.0004	0.0025
0.0089	0.0021	0.0072	0.0279	0.0048	0.0051	0.0045	0.0093	0.0027	0.0045	1.0873	0.0035	0.0014	0.0124
0.0347	0.0185	0.0297	0.0363	0.0284	0.0397	0.0323	0.0328	0.0171	0.0287	0.0274	1.0161	0.1096	0.0629
0.0073	0.0097	0.0164	0.0107	0.0079	0.0093	0.0097	0.0170	0.0129	0.0133	0.0157	0.0081	1.0051	0.0057
0.0802	0.1724	0.2930	0.5174	0.4170	0.4375	0.3911	0.3176	0.1486	0.3758	0.3257	0.1478	0.1009	1.1133
1.5186	1.7233	1.9276	2.3033	2.1166	2.1833	1.9708	2.0216	1.7340	1.7171	1.6784	1.8063	1.5330	1.4489

Table A2. Leontief Inverse, Britain 1935

		1	2	3	4	5	6	7	8	9	10
1	Agriculture	1.0163	0.0004	0.0026	0.0136	0.0005	0.0004	0.0013	0.0011	0.0008	0.0026
2	Coal & Coke	0.0096	1.1011	0.0686	0.0289	0.0601	0.0175	0.0191	0.0223	0.0157	0.0166
3	Other Mining & Nonmetallic Minerals	0.0058	0.0034	1.1063	0.0215	0.0242	0.0344	0.0084	0.0134	0.0272	0.0178
4	Chemicals	0.0619	0.0166	0.0367	1.1316	0.0223	0.0141	0.0529	0.0221	0.0238	0.0415
5	Iron and Steel Manufactures	0.0177	0.0199	0.0147	0.0447	1.3169	0.0464	0.1949	0.2569	0.1207	0.1976
6	Nonferrous Metals	0.0021	0.0016	0.0034	0.0122	0.0502	1.1158	0.0319	0.0325	0.0735	0.0328
7	Shipbuilding	0.0004	0.0001	0.0002	0.0002	0.0002	0.0003	1.0045	0.0002	0.0002	0.0002
8	Mechanical engineering	0.0069	0.0032	0.0054	0.0022	0.0066	0.0057	0.2086	1.0988	0.0178	0.0325
9	Electrical engineering	0.0008	0.0009	0.0021	0.0015	0.0023	0.0100	0.0544	0.0355	1.1368	0.0174
10	Motor Vehicles	0.0147	0.0007	0.0005	0.0007	0.0010	0.0031	0.0010	0.0028	0.0020	1.2683
11	Aircrafts	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	Railway	0.0014	0.0163	0.0017	0.0012	0.0018	0.0051	0.0011	0.0011	0.0012	0.0041
13	Textile Manufactures	0.0166	0.0034	0.0068	0.0112	0.0030	0.0020	0.0211	0.0133	0.0234	0.0362
14	Clothing	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
15	Leather	0.0009	0.0002	0.0002	0.0009	0.0002	0.0001	0.0012	0.0039	0.0005	0.0141
16	Food Industry	0.1718	0.0003	0.0009	0.0147	0.0004	0.0003	0.0008	0.0005	0.0004	Q.0009
17	Wood Industry	0.0084	0.0104	0.0086	0.0076	0.0084	0.0034	0.0307	0.0123	0.0176	0.0075
18	Paper	0.0051	0.0008	0.0103	0.0287	0.0044	0.0014	0.0032	0.0029	0.0125	0.0065
19	Printing & Publishing	0.0075	0.0017	0.0044	0.0555	0.0075	0.0027	0.0056	0.0040	0.0196	0.0190
20	Rubber	0.0027	0.0001	0.0001	0.0001	0.0012	0.0003	0.0015	0.0048	0.0097	0.0482
21	Miscellenous Industries	0.0002	0.0001	0.0001	0.0002	0.0008	0.0001	0.0002	0.0003	0.0002	0.0018
22	Construction	0.0067	0.0021	0.0039	0.0043	0.0040	0.0048	0.0062	0.0038	0.0039	0.0041
23	Gas, electricity and water	0.0059	0.0132	0.0383	0.0262	0.0178	0.0170	0.0187	0.0196	0.0200	0.0183
24	Service	0.1535	0.0475	0.0898	0.1000	0.0913	0.1099	0.0902	0.0866	0.0896	0.0937
	SUM	1.5169	1.2439	1.4057	1.5079	1.6252	1.3948	1.7575	1.6384	1.6171	1.8820

11	12	13	14	15	16	17	18	19	20	21	22	23	24
0.0019	0.0013	0.0076	0.0139	0.1563	0.0745	0.0166	0.0037	0.0009	0.0018	0.0029	0.0013	0.0002	0.0010
0.0090	0.0253	0.0196	0.0093	0.0112	0.0084	0.0079	0.0306	0.0076	0.0159	0.0186	0.0175	0.1159	0.0100
0.0138	0.0089	0.0016	0.0015	0.0029	0.0077	0.0059	0.0082	0.0021	0.0064	0.0042	0.1292	0.0109	0.0065
0.0228	0.0388	0.0287	0.0214	0.0756	0.0232	0.0228	0.0316	0.0244	0.0731	0.0874	0.0318	0.0067	0.0055
0.1024	0.1712	0.0091	0.0158	0.0237	0.0149	0.0630	0.0082	0.0049	0.0285	0.0854	0.1175	0.0412	0.0084
0.0811	0.0402	0.0011	0.0011	0.0019	0.0029	0.0028	0.0009	0.0055	0.0020	0.0090	0.0188	0.0061	0.0015
0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0025
0.0267	0.0809	0.0156	0.0053	0.0018	0.0016	0.0019	0.0059	0.0059	0.0028	0.0025	0.0328	0.0207	0.0030
0.0193	0.0095	0.0012	0.0008	0.0006	0.0005	0.0008	0.0009	0.0008	0.0014	0.0009	0.0178	0.0558	0.0014
0.0006	0.0327	0.0006	0.0006	0.0026	0.0014	0.0006	0.0004	0.0003	0.0004	0.0059	0.0019	0.0006	0.0045
1.0827	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0010	1.0311	0.0011	0.0009	0.0009	0.0007	0.0008	0.0011	0.0006	0.0008	0.0011	0.0039	0.0024	0.0084
0.0402	0.0534	1.5996	0.4932	0.0253	0.0057	0.1068	0.0211	0.0093	0.1943	0.1410	0.0097	0.0027	0.0091
0.0001	0.0001	0.0001	1.0616	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0007
0.0097	0.0013	0.0123	0.0854	1.2206	0.0002	0.0091	0.0003	0.0010	0.0016	0.0066	0.0005	0.0002	0.0006
0.0006	0.0007	0.0016	0.0026	0.0272	1.1819	0.0031	0.0010	0.0004	0.0011	0.0015	0.0011	0.0002	0.0007
0.0100	0.0280	0.0027	0.0034	0.0022	0.0072	1.1003	0.0026	0.0007	0.0012	0.0294	0.0372	0.0031	0.0027
0.0018	0.0052	0.0117	0.0122	0.0060	0.0192	0.0065	1.1518	0.1511	0.0092	0.0197	0.0064	0.0020	0.0049
0.0031	0.0046	0.0059	0.0111	0.0055	0.0162	0.0076	0.0125	1.0539	0.0163	0.0155	0.0041	0.0072	0.0156
0.0080	0.0018	0.0027	0.0110	0.0005	0.0002	0.0003	0.0001	0.0001	1.0075	0.0090	0.0009	0.0006	0.0003
0.0002	0.0002	0.0001	0.0005	0.0054	0.0001	0.0013	0.0001	0.0008	0.0001	1.0170	0.0016	0.0011	0.0007
0.0032	0.0040	0.0048	0.0040	0.0040	0.0033	0.0038	0.0036	0.0028	0.0032	0.0044	1.0558	0.0039	0.0467
0.0137	0.0200	0.0132	0.0120	0.0095	0.0075	0.0122	0.0131	0.0104	0.0251	0.0106	0.0111	1.1750	0.0087
0.0726	0.0909	0.1097	0.0930	0.0916	0.0752	0.0869	0.0826	0.0641	0.0736	0.1003	0.1058	0.0896	1.0732
1.5245	1.6504	1.8510	1.8609	1.6754	1.4527	1.4612	1.3806	1.3480	1.4665	1.5731	1.6071	1.5464	1.2167

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