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**The Marshall Plan: Economic Effects
and Implications for Eastern Europe
and the Soviet Union**

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1. Introduction

The Marshall Plan is hailed as one of the great foreign economic policy achievements of the 20th century. Between 1948 and 1951 the United States transferred \$13 billion to the war-torn economies of Europe.¹ This timely and generous program of aid is said to have solidified US leadership of the western alliance, buttressed moderate elements in Western European politics, smoothed Europe's labor-management relations, and checked the westward march of communism (Kolko and Kolko, 1972; Patterson, 1973).

Less transparent are its economic effects. Qualitative discussions typically credit the Marshall Plan with a significant impact on Europe's recovery from World War II.² After stagnating through much of 1947, European growth accelerated in 1948, coincident with the release of Marshall aid. The continent then embarked on two decades of sustained high growth. The concurrence of Marshall Plan inflows with the quickening of growth has encouraged observers to attribute European prosperity to the American program.

Quantitative discussions (e.g. Collins and Rodrik, 1991) are more skeptical. Marshall aid averaged only 2 1/2% of the combined national incomes of the recipient countries over the period it was in effect. Even at its height it could have financed no more than 20% of their capital formation. There is no obvious correlation across countries between the magnitude of Marshall Plan allotments and the pace of economic growth. Germany grew most quickly during the Marshall Plan years, but its share of American aid was not large. Given the existence of alternative explanations for Europe's rapid growth -- notably postwar reconstruction and scope for catching up to the United States -- there is no a priori case for attaching particular weight to the Marshall Plan.³

The present paper is a first attempt to evaluate the Marshall Plan's economic effects. The central questions have obvious relevance for the current situation in Eastern Europe and the Soviet Union. Was the Marshall Plan instrumental in initiating European economic recovery from World War II? Did it not only initiate the recovery but also have permanent growth effects? How important were the conditions attached to US aid in shaping its effects? Could a concerted program of foreign aid have a similar impact in Eastern Europe and the Soviet Union today?

We find that the Marshall Plan had a significant impact on Europe's recovery from World War II. The recipients of large amounts of Marshall aid recovered significantly faster than other industrial countries. Strikingly, however, we find that the obvious channels through which the Marshall Plan could have affected European recovery -- stimulating investment in plant and equipment, augmenting capacity to import, and financing public investment on infrastructure repair -- were relatively unimportant. Postwar Europe's crisis, in other words, was not a crisis of insufficient investment, inadequate capacity to import raw materials, or inability to repair devastated infrastructure.

Rather, the European economy on the eve of the Marshall Plan was experiencing a "marketing crisis," in which producers refused to bring goods to market, and workers and managers limited the effort they devoted to market activity. Political instability, shortages of consumer goods and fears of financial chaos led them to hoard commodities and withhold effort. The Marshall Plan facilitated the restoration of financial stability and the liberalization of production and prices; this was its crucial role.

The Marshall Plan thereby allowed Europe to return to its underlying growth path more quickly than would have been possible otherwise. Indeed, one can imagine, had the Marshall Plan not been forthcoming and had the postwar crisis deepened, that democratic institutions and the commitment to the market might have broken down, preventing Europe from returning to that growth path at all.

These conclusions have obvious implications for Western aid to the ex-Soviet Republics (USSR for short), where uncertainty about the pace of liberalization and about the prospects for monetary stability have given rise to shortages of consumer goods and financial chaos resembling those which plagued Western Europe after World War II. In the absence of a social contract, struggles over income distribution threaten to swamp efforts to raise productivity. Western aid could facilitate solutions to both problems.

Equally, there are important differences between the two settings. Compared to Europe a half-century ago, today's USSR possesses less experience with and commitment to the market. The institutional infrastructure that is a prerequisite for an aid-instigated acceleration of economic growth like that postwar Europe enjoyed is not yet in place. Not even the outlines of a social contract are evident. These considerations mitigate against a Marshall Plan for the East.

2. Background

European economic recovery from the conclusion of hostilities to the inauguration of the Marshall Plan falls into two phases: 6 quarters of rapidly rising output achieved mainly through repair of infrastructure and

productive capacity, followed by 6 more difficult quarters when the gains of the preceding period had to be consolidated.

2.1 Recovery Before the Marshall Plan: The First Phase
(Mid-1945 Through 1946)

The first 18 months of the pre-Marshall Plan period, from mid-1945 through the end of 1946, were marked by rapid output increases. Industrial production had fallen to 30-40% of prewar levels in Belgium, France and the Netherlands, and to less than 20% in Italy and Germany. The slump in industrial output reflected not the wholesale destruction of capacity, however, but disruption to the channels for obtaining inputs and distributing outputs. In Italy, for example, no more than 20% of industrial capacity had been destroyed by fighting, bombing, sabotage and the removal of plant and equipment to Germany (Grindrod, 1955, p.39). The low level of output reflected rather the difficulty of obtaining raw materials, transporting goods and distributing food. The majority of the continent's freight cars were damaged or destroyed. Blocked waterways and lack of barges and tugs crippled water transportation. At the time of liberation, only 5% of France's inland waterways were open to navigation. Roads, bridges and rail links were out of commission.

These conditions provided scope for rapid output growth through the reconstruction and repair of infrastructure. European industrial production (including mining, manufacturing, building and construction) rose quickly, to 83% of 1938 levels in the fourth quarter of 1946.

Sectors producing final goods were fastest to expand. Resuming the fabrication of finished goods required only the repair of some machinery. Manufactures found a ready market. Often, however, raw material supplies were

a binding constraint. Except in Germany, European forests had been overcut during the war, limiting supplies of timber. Coal production remained depressed due to manpower shortages and the destruction of mines. The output of iron and steel recovered only slowly, due in part to the lack of coal. In countries like Germany, the shortage of spare parts for industrial equipment was acute.

The incidence of recovery was uneven. As Table 1 shows, those parts of Europe remote from the main theaters of the war -- the UK, Ireland and much of Scandinavia -- were most successful at quickly surpassing prewar levels of industrial activity. Italy, Greece and the Netherlands, along with Germany, in contrast, failed to match prewar levels of manufacturing.

Compared to industry, agriculture recovered slowly from the war. Table 2 shows that in 1946 European agricultural production was still less than two-thirds that of 1938. (Industrial production outside Germany, in contrast, had already matched its 1938 peak.) Grain and potato output recovered quickly, that of meat and dairy products less so. Wartime slaughtering of livestock, destruction of farm machinery, and inadequate use of fertilizers all hampered European agriculture. Even where capacity could be restored swiftly, many crops required a 6 or 12 month harvest cycle and livestock a comparable gestation period. Considerable delay consequently ensued before the appearance of an output response. Price controls on foodstuffs were kept in place longer than other price ceilings, discouraging the expansion of production. Fertilizers and machinery required by agriculture were in particularly short supply.

Table 1

THE LEVEL OF INDUSTRIAL PRODUCTION

Index numbers based on 1938 and 1947

Country	1938 = 100				1947 = 100						
	1946	1947			1947			1948			
		1947	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter		Second quarter	Third quarter	Fourth quarter
Austria ^a	40 ^c	48	74	70	106	111	113	122	156	163	173
Belgium	89	106	115	95	102	97	108	106	107	107	113
Bulgaria	122	145	170	81	96	109	114	94	111	129	134
Czechoslovakia ^a	--	87	102	93	104	95	109	112	119	110	125
Denmark	101	116	130	97	95	99	106	109	114	108	118
France ^b	79	95	108	98	106	96	101	115	121	106	112
Germany: U.K./U.S.Zone ^c	29	34	51	78	102	107	112	122	127	165	191
Greece	56	71	77	90	101	101	109	100	101	108	128
Ireland	110	116	137	91	96	101	112	107	119	114	--
Italy	61	81	87	79	108	109	104	98	107	111	114
Netherlands	74	94	112	89	96	100	114	110	117	120	130
Norway	94	108	118	99	104	93	105	109	117	96	114
Poland	79	104	133	91	97	100	113	124	130	125	134
Sweden	136	138	143	99	100	99	100	102	103	103	105
United Kingdom	100	108	121	90	101	99	110	112	112	107	117
Total of above countries:											
including Germany	72	83	96	90	102	100	108	112	116	114	124
excluding Germany	88	100	113	91	102	99	107	111	114	109	117

^a The base of the annual index numbers for Austria and Czechoslovakia in 1937; for the U.S.S.R., 1940.^b Excluding the Saar.^c The indices of the U.K./U.S. Zone have been given the weight of the three Western zones.

Source: United Nations (1949a), p.4.

Table 2

The Level of Agricultural Production in Europe^a

Index Numbers — 1935-38 = 100

	Percentage of pre-war total European production ^a	1945/46	1946/47
Austria	1.63	56	63
Belgium	2.09	58	72
Bulgaria	1.54	49	73
Czechoslovakia	3.75	56	73
Denmark	1.93	87	94
Finland	1.02	73	76
France	15.72	50	73
Germany (three Western Zones)	10.61	68	65
Greece	1.21	41	77
Hungary	2.45	54	55
Ireland	1.50	111 ^b	108 ^b
Italy	8.42	79	77
Netherlands	2.58	56	79
Norway	0.62	75	87
Poland	9.36	33 ^b	45 ^b
Portugal	0.91	80	95
Rumania	3.57	34 ^b	57 ^b
Spain	5.39	49 ^c	92 ^c
Sweden	2.08	98	103
Switzerland	1.38	90	87
Turkey	2.33	119 ^b	119 ^b
United Kingdom	5.89	106	106
Yugoslavia	3.42	50	57
Total of above countries:			
including Germany	89.40	63	75
excluding Germany	78.79	62	76

^a Europe excluding U.S.S.R.^b Base of the index numbers: 1934-1938.^c Base of the index numbers: 1930-1934.

Source: United Nations (1948a), p.11.

2.2 Recovery Before the Marshall Plan: The Second Phase
(1947 Through Mid-1948)

The second phase of the pre-Marshall Plan period, from the beginning of 1947 to the release of Marshall aid, was marked by mounting difficulties. According to World Bank experts, "no further progress was made in 1947" (IBRD, 1948, p.1). Leaving aside Germany, industrial output in 1947-III was no higher than at the end of 1946. The fourth quarter of 1947 was marked by a growth spurt, with industrial output rising by 8%. Then, however, stagnation set in again: output in 1948-III was essentially unchanged from a year before. Europe's recovery seemed in jeopardy.

We regard this view as overly pessimistic. There is no indication that the growth process had petered out. Annual averages show, notwithstanding temporary setbacks, expansion throughout the period. Taking annual averages, European industrial production (excluding Germany) was 14% higher in 1947 than in 1946.

Observers may have been generalizing from more serious problems in agriculture. Measured agricultural output was 3% lower in 1947 than in the preceding year. Unseasonable weather in the winter and spring of 1947 depressed yields. Winter frost damaged plants and trees; spring and summer drought then hindered their recovery.

Pessimism may have also stemmed from developments which bode ill for the future. Increasingly pervasive shortages threatened to create disruptive bottlenecks. The fuel shortage associated with the cold winter of 1947 limited energy supplies to manufacturing and transport. Thawing snows flooded coal mines, and summer drought reduced supplies of hydroelectric power. Iron and steel shortages disrupted fabricating industries requiring metals as inputs. Shortages of industrial raw materials became increasingly prevalent.

Except in the UK, the scarcity of special purpose machine tools emerged as a serious problem. The dearth of foodstuffs limited caloric intake and labor productivity. These developments may not yet have brought growth to a halt, but they threatened to do so.

Such difficulties were thought to reflect three specific problems: the slump in international trade which tightened the foreign exchange constraint; inadequate fiscal capacity which limited infrastructure repair; and low levels of income which constrained domestic savings. Following an overview of economic growth in the Marshall Plan years, we consider these problems in turn.

2.3 Economic Growth in the Marshall Plan Years

Discussions of the economic effects of the Marshall Plan (viz. Berolzheimer, 1953; Kirman and Reichlin; 1991) typically compare industrial production at the start and end of the program. Between 1947 and 1951 industrial output in the participating countries rose by 55%. (See Table 3.) Growth rates ranged from 7% in Turkey to 269% in Austria and 312 per cent in the Federal Republic of Germany. More typical were Denmark, Norway, the UK, Belgium and France, in each of which industrial production rose between 30 and 40% over the four years. Excluding Germany, the rise in industrial production averaged 37%. This was remarkably rapid progress.

[Box 1 about here]

The question is how much of this performance is attributable to the Marshall Plan. Variations in the rate of industrial production provide few hints. Europe's industrial output rose by 15% between 1946 and 1947, by 16 per cent between 1947 and 1948 and by 14% between 1948 and 1949.⁴ In the

Table 3. Indexes of Production in Western Europe

(1938=100)

Country	1947	1948	1949	1950	1951	Percentage Increase 1951 over 1947
Turkey	153	154	162	165	163	7
Sweden	142	149	157	164	172	21
Ireland	120	135	154	170	176	46
Denmark	119	135	143	159	160	35
Norway	115	125	135	146	153	33
United Kingdom	110	120	129	140	145	32
Belgium	106	122	122	124	143	33
Luxembourg	--	139	132	139	168	--
France	99	111	122	123	138	39
Netherlands	94	114	127	140	147	56
Italy	93	99	109	125	143	54
Greece	69	76	90	114	130	88
Austria	55	85	114	134	148	269
Germany (Federal Republic)	34	50	72	91	106	312
All Participating Countries	87	99	112	124	135	55
All Participating Countries Exclusive of Germany (Federal Republic)	105	119	130	138	145	37

Source: U.S. President, First Report to Congress on the Mutual Security Program (December 31, 1951), p. 75. Drawn from Brown and Opie (1953), p. 249.

aggregate, then, there is essentially no variation in the period spanning the inauguration of the Marshall Plan.

Europe's agricultural output also rose impressively over the Marshall Plan years, by 37% in the OEEC countries (Table 4). Again, however, variations in the rate of output growth provide few hints about the role of the Marshall Plan. Measured production rose by 19% between 1945/46 and 1946/47, declined marginally between 1946/47 and 1947/48, reflecting the unfavorable weather of the latter year, but then rose strongly, by 17% between 1947/48 and 1948/49 and by 10% the following year. Unless the rebound from the bad harvest of 1947/48 is attributable to the Marshall Plan, its effect is not obvious.

Nor do cross-country variations in the rate of economic growth strongly support the existence of a Marshall Plan effect. Figure 1 juxtaposes Marshall Plan allotments as a share of GNP against the growth rate. There is considerable variation in the generosity of American aid. Austria and the Netherlands received Marshall transfers amounting to nearly 6 and 4% of GNP respectively, while Sweden's aid was less than 1/2% of national income. More typical were Belgium, Denmark, France, Italy, Norway and the UK, all of which received about 2% of GNP. The figure suggests at best weak positive correlation between the growth rate and Marshall Plan receipts as a share of national income. A regression of growth on a constant and on Marshall Plan allotments as a share of GNP fails to turn up a statistically significant relationship.

Following the Marshall Plan's inauguration, the foreign trade of the participating countries rose even more strongly than their domestic production. This is in contrast to the preceding depression in intra-European

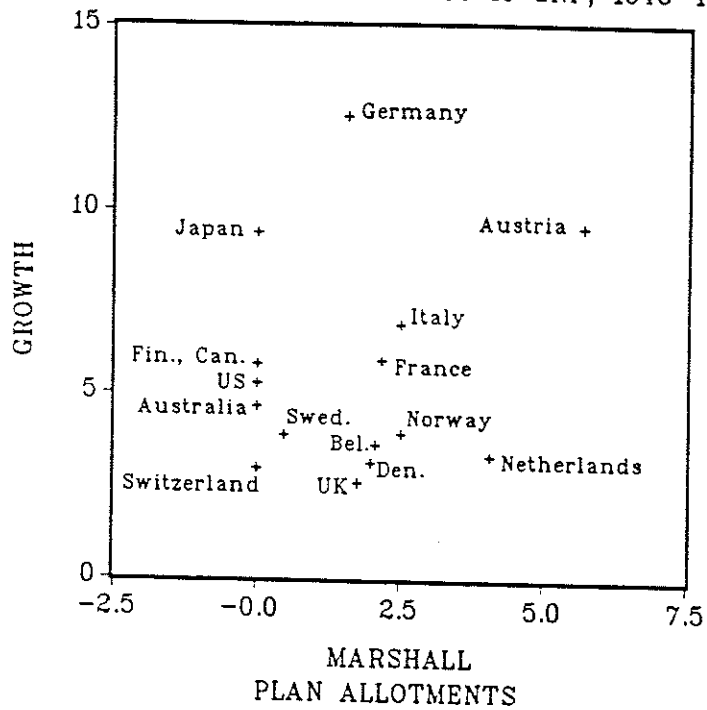
Table 4. Index of Total Agricultural Output
for Human Consumption of OEEC Countries
(Prewar=100)

Country	1947-48	1948-49	1949-50	1950-51
Austria	53	66	79	88
Belgium-Luxembourg	83	93	116	119
Denmark	84	92	113	126
France	78	100	103	111
Germany (Federal Republic)	60	76	96	106
Greece	83	79	110	93
Ireland	89	88	95	103
Italy	85	95	103	109
Netherlands	79	93	116	119
Norway	86	92	112	120
Sweden	101	111	115	116
Switzerland	95	98	98	104
Turkey	96	120	94	106
United Kingdom	95	111	114	122
All Member Countries	81	95	104	111

Source: OEEC Statistical Bulletins (Paris, May 1952), Table II, 1, p. 66.
Drawn from Brown and Opie (1953), p. 253.

Figure 1

Annual Rate of GDP Growth and Marshall Plan Allotments as a Share of GNP, 1948-1951



and intercontinental trade. Total exports in constant prices rose at an annual rate of more than 20% between 1947 and 1950. Europe's imports expanded more slowly than its exports, as was desired by those who wished for a strengthening of its current account.

By all three criteria, then -- industrial output, agricultural productivity and trade -- Europe's economic performance years was admirable, absolutely and relative to the preceding period. The problem is to identify the contribution to this admirable performance of the Marshall Plan.

3. Short-Term Effects

We turn now to this problem, concentrating in this section on short-term effects in the period when the Marshall Plan was in operation.

As we have seen above, traditional accounts of the situation facing European policymakers on the eve of the Marshall Plan emphasize saving, imports of industrial inputs, and public investment as constraints on economic growth. In Appendix A we develop a three-gap model which shows that foreign aid which supplements domestic saving, augments imports of industrial inputs, and allows increases in public investment can have a major impact on current levels of output. In fact, however, it turns out that these were not the principal channels through which the Marshall Plan stimulated European economic growth.

3.2 The Savings-Investment Gap

Was investment a significant short-run constraint on European economic growth, as was possible in theory? Did the Marshall Plan, by boosting investment, significantly raise the level of output? Although qualitative

accounts typically answer both questions positively, systematic analysis gives grounds for skepticism.

The notion that the savings gap bound in the aftermath of World War II is implicit in accounts suggesting that the residents of many European countries were living close to subsistence. A physically active man requires 3,200 to 5,500 calories daily, depending on the nature of his work. In 1946 UN experts figured that more than 140 million Europeans were receiving fewer than 2,000 calories daily, while an additional 100 million Europeans were receiving fewer than 1,500 calories. In Germany, where the official ration was 1,550 calories, the actual ration as late as 1948 was as little as 1,000 calories. The implication, according to N.H. Collison, Deputy Chief of the ECA Mission to the Bizone, was that there was "little savings in Germany" (US House, 1949, p.227).

Table 5 shows saving rates following the war and compares them with those prevailing in the 1950s. That savings rates were highest in countries with relatively high per capita incomes is consistent with the view that persons living close to the margin of subsistence were unwilling or unable to defer consumption to the future. For every European country but Norway, moreover, savings rates were lower prior to 1952, when low incomes and inadequate nutrition were a particular problem. Strikingly, however, savings rates also were low in the United States, Canada and Australia, where they were hardly constrained by low levels of income. The US was pegging interest rates at low levels until the Fed-Treasury Accord of 1951; it could be that low interest rates affected savings propensities.⁵

More than low levels of income seem to have contributed, then, to Europe's low savings rates. Moreover, just because savings and investment

Table 5

Savings Rates in the Aftermath of World War II
and in the 1950s
(in per cent)

<u>Period</u>	<u>1946-1951</u>	<u>1948-1951</u>	<u>1952-1960</u>
Australia	16	20	21
Austria	na	12	23
Belgium	na	na	17
Canada	16	20	21
Denmark	15	23	25
Finland	14	24	27
France	na	18	20
Germany	na	19	27
Italy	15	18	19
Japan	15	18	24
Netherlands	na	20	27
Norway	28	35	34
Sweden	17	21	22
Switzerland	na	10	23
UK	9	13	16
US	14	17	18

Note: Savings rates are calculated as the sum of investment and the current account surplus.

Source: Mitchell (1975, 1983).

rates were low, it does not follow that growth had to be significantly constrained. Figure 2 juxtaposes investment rates in the Marshall Plan years against rates of economic growth. It is clear that the investment ratios of the high growth countries, Austria and Germany, were unexceptional. Other countries, notably Norway and the Netherlands, placed an even greater emphasis on investment (see Price, 1955). The figure indicates only a weak relationship between the investment share of GNP and the growth rate.

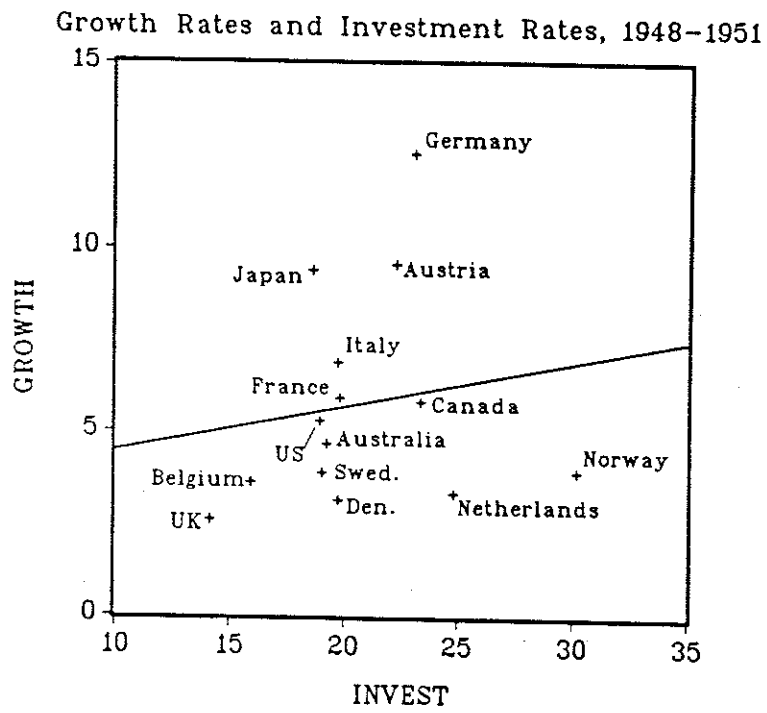
These relationships can be analyzed more rigorously. In Appendix B we report multivariate regressions linking Marshall Plan allotments to investment, and in Appendix C we use regression to link investment to growth. We find that Marshall Plan inflows were positively (and significantly) associated with subsequent investment even after controlling for other determinants of capital formation. Transfers equal to 2% of GNP raised investment by 0.7 per cent of GNP in the following year.

Moreover, the rate of GDP growth was positively related to investment, although the magnitude and significance of the effect depend on the specification. When all countries are treated symmetrically, it appears that raising the investment share of GNP by 0.7% would have raised the growth of domestic output by only about 0.1%, a small effect. We can give investment the benefit of the doubt by allowing the output effect to be different for Norway, which raises the estimated elasticity for other countries to 0.4; now raising the investment share of GNP by 0.7% would have raised the growth rate of domestic output by 0.3%.

[Box 2 about here]

That \$1 of Marshall Plan aid raised domestic investment by as much as 40 cents is striking when it is recalled that the vast majority of aid-financed

Figure 2



imports took the form of food and raw materials. Equally, that an additional percentage point of GNP devoted to investment raised the growth rate by more than a third of a percentage point is striking when one observes that we are considering a period as short as a year.⁶ Yet even accepting these upper-bound estimates, the combined impact on European economic recovery was small. Marshall aid in the amount of 2 1/2% of recipient GDP, operating through this channel, raised the growth rate by only half a percentage point. While helpful, this is hardly the dramatic stimulus trumpeted by champions of the Marshall Plan.

3.3 The Foreign Exchange Gap

Was capacity to import a significant constraint on European economic growth? Did the Marshall Plan, by providing additional foreign exchange, alleviate bottlenecks that otherwise would have stifled production? Again, while qualitative accounts emphasize the importance of the foreign exchange gap, more systematic analysis challenges the notion that it was a significant constraint on growth.

Imported raw materials were important to the operation of European industry. Cotton for the textile industry was in short supply.⁷ So was the coal needed to provide power for manufacturing and to refine petroleum for transportation. The output of Ruhr coal, which "provided the basis for much of the industrial development on the European Continent," had recovered to only 65% of prewar levels by the end of 1947 (Federal Reserve Board, 1948, p.134). Western European coal production as a whole was still only 80% of prewar.

The current account gap ostensibly bound not only for intermediate inputs but for foodstuffs as well. The American and British zones of Germany produced less than two-thirds of the modest food ration permitted by the occupation authorities. The rest had to be imported. Paul Hoffman, the ECA administrator, told the Senate Foreign Relations Committee that "In some cases I think the very No. 1 recovery item is a little more food to get a little more work out of people" (U.S. Senate, 1949, p.75).

The current-account constraint bound only if reserves were depleted and foreign borrowing was precluded. In fact, reserves had been exhausted in the first postwar quarters, and foreign capital (mainly direct investment) supplemented domestic savings only modestly once aid fell off in 1947 (Table 6). American investors' unsatisfactory experience with foreign lending after World War I surely helped to shape these trends. Two-thirds of the foreign dollar bonds floated in the U.S. in the 1920s lapsed into default in the 1930s, and more than a few remained in default following the war. The disorganization of the European economy and of its finances reinforced U.S. investors' caution.

Figure 3 shows the current account balances of our 16 countries. Austria, Denmark, France, Germany, the Netherlands and Norway all ran substantial current account deficits. There is a strong positive relationship between the current account deficit and Marshall Plan transfers. A regression of the current account on a constant and on the Marshall Plan variable suggests that increasing Marshall aid by 1% of GNP allowed a country to increase its current account deficit by 0.9% of GNP.

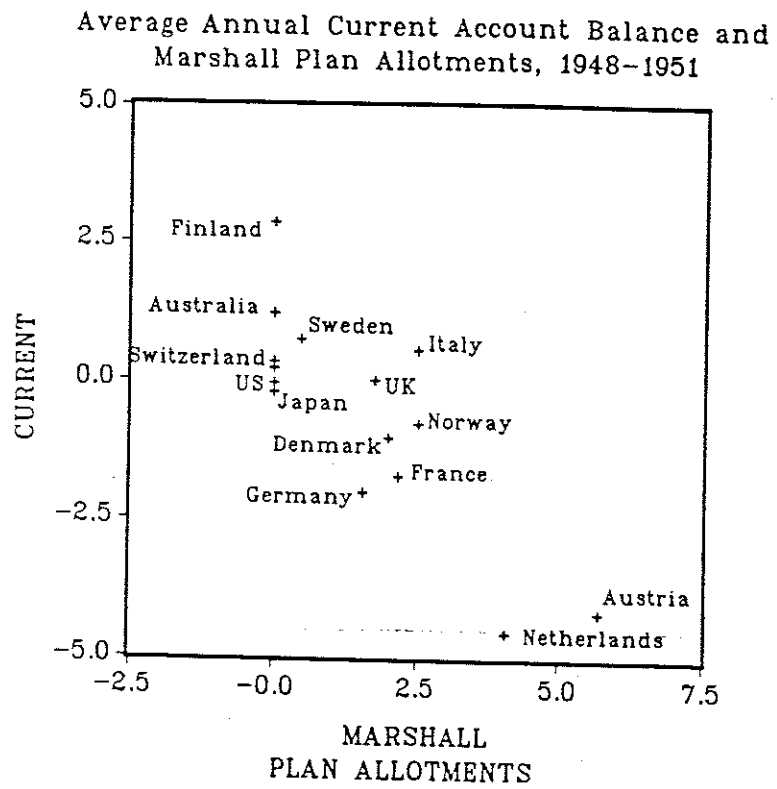
This simple correlation exaggerates the impact of the Marshall Plan on the current account, since causality also ran in the other direction:

Table 6. The Financing of Europe's Overseas Deficit
(Billions of current dollars)

Item	1947		1948		1949		1950		
	United States	Other Overseas Countries Total	United States	Other Overseas Countries Total	United States	Other Overseas Countries Total	United States	Other Overseas Countries Total	
I. Balance on goods and services and other transactions making up the deficit:									
Balance on goods and services	-5.6	-1.8	-7.4	-3.4	-1.5	-4.9	-3.2	-0.6	-3.8
Private donations	+0.4	..	+0.4	+0.4	-0.1	+0.3	+0.4	-0.1	+0.3
Private capital movements	+0.3	-1.1	-0.8	+0.2	-0.1	+0.1	-0.1	-0.1	-0.5
Special official financing (debt settlements, specific investment projects, etc.)	-0.6	-0.1	-0.7	-0.2	-3.0	-0.5	+0.2	-0.4	-0.2
Total deficit to be financed:									
Unadjusted	-5.5	-3.0	-8.5	-3.0	-2.0	-5.0	-2.7	-1.5	-4.2
Adjustments	-0.3	..	-0.3	..	-0.1	-0.1	-0.2	+0.7	+0.5
Adjusted	-5.8	-3.0	-8.8	-3.0	-2.1	-5.1	-2.9	-0.8	-3.7
II. Official financing of a compensatory nature:									
Government grants	+1.0	..	+1.0	+3.2	..	+3.2	+4.1	..	+4.1
Long-term capital movement	+3.8	+0.9	+4.7	+1.1	+0.5	+1.6	+0.7	-0.5	+0.2
Financing by international institutions	+1.1	+0.1	+1.2	+0.3	..	+0.3	..	..	..
Movement in sterling balances	..	-0.6	-0.6	..	-0.2	-0.2	..	-0.5	-0.5
Movement in U.S. dollar balances	+0.8	..	+0.8	-0.3	..	-0.3	-0.1	..	-0.1
Gold movement	+1.9	-0.2	+1.7	+0.9	-0.4	+0.5	+0.2	-0.2	..
Total compensatory official financing	+8.6	+0.2	+8.8	+5.2	-0.1	+5.1	+4.9	-1.2	+3.7
+2.7									
+0.2									
..									
+0.9									
..									
-0.2									
-1.3									
+1.4									
+0.5									
+1.9									
III. Multilateral settlements in U.S. dollars:									
ERP reimbursement for European purchases outside the United States	..	..	..	-0.8	+0.8	..	-1.0	+1.0	..
Other dollar settlements by European countries outside the United States	-2.8	+2.8	..	-1.4	+1.4	..	-1.0	+1.0	..
Total multilateral settlements in U.S. dollars	-2.8	+2.8	..	-2.2	+2.2	..	-2.0	+2.0	..
-0.4									
+0.4									

Source: United Nations (1950), p. 116; United Nations (1951), p. 118.

Figure 3



countries with larger current account deficits received more American aid. Multivariate regression analysis confirms that recipients of Marshall Plan aid were able to run larger current account deficits. Upon controlling for simultaneity and for other determinants of the current account, however, the incremental effect turns out to be small. Countries receiving \$1 of Marshall Plan aid increased their current account deficits by 12 cents. That current account deficits did not widen further reflects the fact that one goal of US policy was to produce current account balance between Europe and the US. The conditions attached to American aid thus may have worked to limit the growth of European trade deficits.

Even if ability to run larger current account deficits had a major effect on growth by relaxing resource bottlenecks, the growth effect of the Marshall Plan, operating through this channel, still would have been small because the change in current accounts was small. But in fact, the regression analysis in Appendix C suggests a negligible relationship between current account balances and growth once other determinants of the change in GDP are controlled for. The explanation for these small effects is that resource bottlenecks had only a small impact on production.⁸ Consider the case of coal, the most important intermediate input in short supply. Coal was critical for the generation of electric power, which in turn was required for the operation of a wide range of industrial sectors. But over the Marshall Plan years, Europe imported only about 7% of its apparent coal consumption. If half of European production took place in sectors that were coal burning and unable to substitute other sources of fuel, 7% of that half would have had to shut down. European output would have fallen by 3 1/2%.

Readers may object to this back-of-the-envelope calculation for neglecting indirect effects and general equilibrium repercussions. One can imagine, for example, a small decline in coal consumption producing a large decline in steel output, which in turn provoked an even larger fall in output in sectors where steel was an essential input. De Long and Eichengreen (1991) therefore use input-output analysis as a check on these calculations. Utilizing an input-output table for Italy in 1950, they eliminate all Marshall-Plan-financed coal imports and assume that all uses of coal would have been proportionately reduced in the absence of Marshall Plan imports.⁹ They find that industrial production would have fallen by 6.8% and the supply of transportation services by 7.3%, but that agriculture and services would have been unaffected. Since industry and transport account for less than half of national output, the latter would have fallen by 3.2%. This confirms the back-of-the-envelope calculation above.

Of course, this exercise assumes that production functions were Leontief and that, except for the elimination of ECA imports, the allocation of foreign exchange would have remained unchanged. Both assumptions are extreme. To the extent that elimination of the Marshall Plan would have been accompanied by some compression of consumer goods imports, imports of coal and other intermediates would have had to fall by less than assumed above. Insofar as firms could adopt less energy-intensive techniques in response to the coal shortage, the decline in production would have been moderated further. Thus, the 3% output decline estimated above should be regarded as a generous upper bound on the Marshall Plan's contribution through the elimination of bottlenecks.

3.4 The Fiscal Gap

Was the capacity to finance spending on infrastructure repair and other public programs a significant constraint on European recovery? Did the Marshall Plan, by providing governments with additional resources, stimulate growth by relaxing this constraint? While qualitative accounts emphasize this channel, once again systematic analysis refutes the notion that it was a significant constraint on growth.

We do not deny the existence of fiscal problems. Budget deficits in 1946 approached 10% of national income in the UK, Italy and France, and exceeded that threshold in Belgium. Dutch deficits were probably larger still. Given foreigners' unwillingness to lend and the dearth of domestic savings, these budget deficits were financed largely through monetization. Where they were closed, this was accomplished by reducing the government-expenditure share of GNP. The share of public investment in national income was forced to decline. Of 14 European countries, this share rose between 1947 and 1948 only in Belgium, Finland, Italy and Poland.

Nor can one deny the destructiveness of the war. In France, 4,000 kilometers of railway track and more than half of all rail yards had been destroyed. In Belgium, France, the Netherlands and Poland fewer than half of all steam locomotives remained in serviceable condition. Vital bridges had been destroyed in operations culminating in the invasion of Germany. It hardly paid to invest in plant and equipment or to produce for the market where roads and railways remained in disarray and goods could not be transported to ports or mercantile centers.

Yet the worst of this damage was repaired before the Marshall Plan came on stream. Railway track and locomotives were quickly restored. By the last

quarter of 1946, nearly as much freight was loaded onto railways in Western Europe as had been transported in 1938. In the British zone of occupied Germany, where only 1,000 km. out of 13,000 km. of track was usable at the war's end, 12,000 km. were back in operation by June 1946. (If ton-kilometers rather than tonnage are used, recovery is faster still.) Water systems and electricity supply were quickly restored. The implications for production were immediate. Excluding Germany's three western zones, by the fourth quarter of 1946 Europe's industrial output nearly matched 1938 levels.

Regression analysis lends no support to the notion that the Marshall Plan operated through this channel. There is no indication in Appendix B that Marshall Plan inflows allowed for increased levels of government spending. Nor is there evidence that government spending in 1948 and after had a significant impact on the rate of economic growth.

3.5 Combined Effects

To estimate the combined effects of the Marshall Plan operating through the investment, current account and public spending channels, we simulated a system of four equations: a growth equation determining the percentage change in GDP and three equations determining investment, the current account and government spending respectively.¹⁰ These relationships form a recursive system. The Marshall Plan affects investment, the current account and government spending with a lag; in turn these variables affect economic growth. To isolate the impact of the Marshall Plan, we simulate the equations using historical values of the exogenous variables, and then set the Marshall Plan variables to zero and compute counterfactual values for GDP growth. The

difference between the predicted and counterfactual simulations is the Marshall Plan effect.¹¹

The change in output is shown in Figure 4. The sum of three small numbers is still a small number. Marshall Plan allotments are shown to have raised GDP in the recipient countries by an average of less than 0.1% in the two years following its implementation, when according to our model it should have had its largest effects. Since all effects are linear, the change is largest in Austria and the Netherlands, which received the most aid, and smallest in Sweden, which received the least.

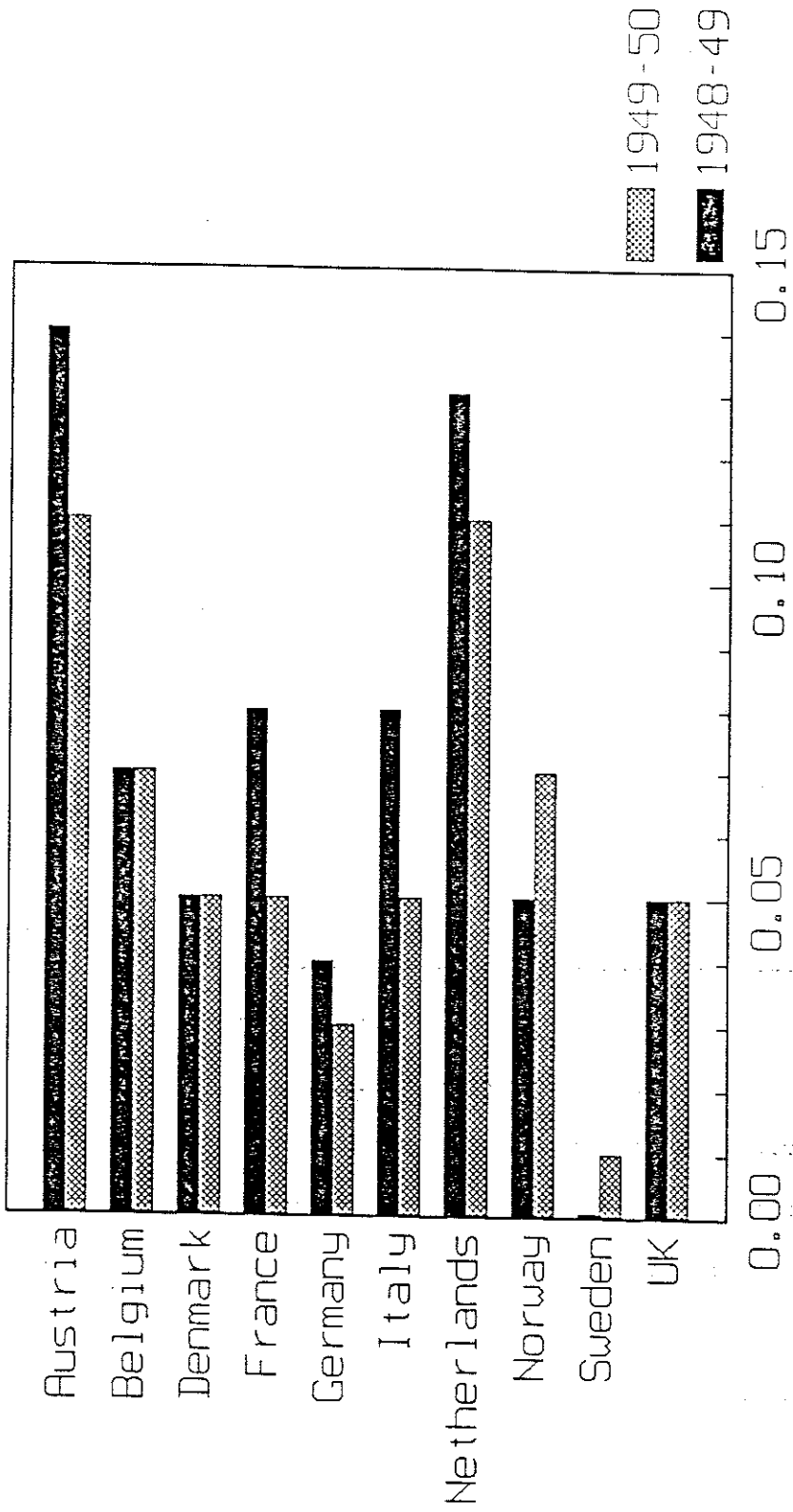
3.6 Is Something Missing?

But is it correct to assume that the Marshall Plan operated exclusively through the savings, current account and fiscal gaps? If it affected growth also through other channels, the approach taken in the previous section will fail to capture the full effect. We addressed this possibility by also including the Marshall Plan allotment in our growth equations directly. Its coefficient should capture effects of the Marshall Plan not operating through induced changes in investment, the current account and public spending. In addition, we interacted the Marshall Plan with investment, the current account and government spending to allow for the possibility that these effects operated most powerfully where investment was low, the current account deficit was large, or government spending was constrained.

The additional variables showed up as statistically significant determinants of the rate of output growth. Countries receiving large Marshall Plan allotments grew faster even after controlling for investment and other determinants of growth. The direct effect of that Marshall Plan allotment was

Figure 4

Additional Output Growth Due to the Marshall Plan, Including Only Investment, Current Account and Government Spending Linkages



largest where investment, the current account surplus and government spending as shares of GNP were low. These coefficients were large, indicating that the main effects of the Marshall Plan operated by means other than altering levels of investment, the current account and government spending.

Figure 5 shows the results of counterfactual simulations when all channels are allowed to operate. The effects of the Marshall Plan, especially in 1948-49, are an order of magnitude larger than before. Austria, which received Marshall aid equalling 7% of GNP in 1948, grew as a result by an additional 7 percentage points between 1948 and 1949. In Austria, France, Germany, Denmark and the Netherlands, the rate of return on US aid in 1948 was on the order of 100% even if none of the effects lingered!

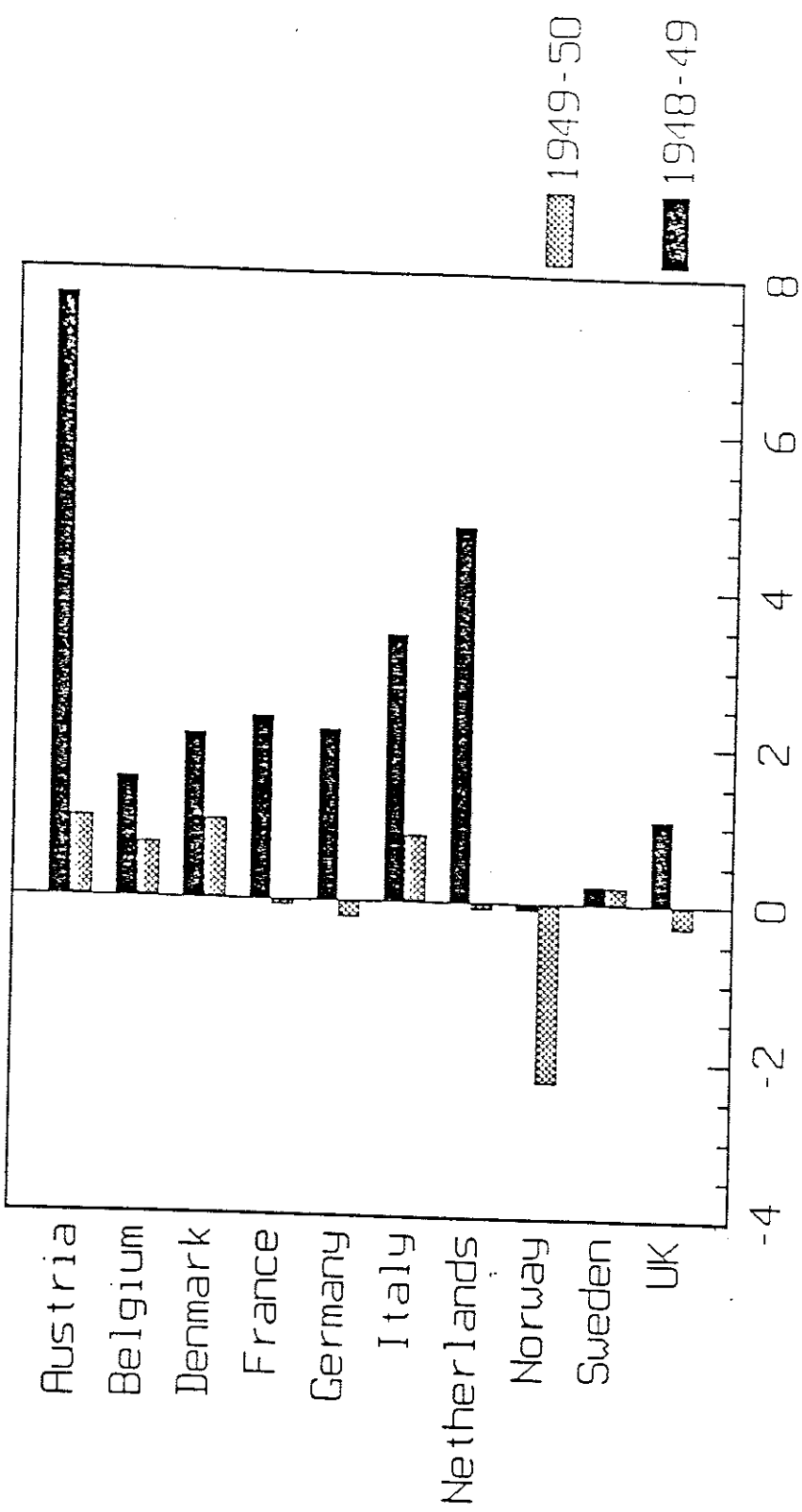
Simulations of the complete model thus suggest very large effects of the Marshall Plan. But if those effects did not operate by changing the levels of investment, the current account or public spending, what did they reflect?

4. The Marshall Plan and the Marketing Crisis

The association of the Marshall Plan with this dramatic burst of growth reflected contributions neglected by the three-gap model and the traditional literature described above. The Marshall Plan allowed the restoration of financial stability. It encouraged policy reforms allowing the free play of market forces. Thus, it resolved the marketing crisis into which the European economy had sunk. It did so by addressing two problems: shortages due to repressed inflation, and policy uncertainty that heightened the option value of waiting.

Figure 5

Additional Output Growth Due to the Marshall Plan, Including Investment, Current Account and Government Spending Linkages and Interaction Effects



4.1 Shortages and Repressed Inflation

The plight of the European economy in 1947 is best understood as a marketing crisis akin to that afflicting the USSR today. Prices were controlled at unsustainably low levels, encouraging hoarding and inducing producers to withhold their goods from market. In France, the interim Blum Government and the Ramadier Government that succeeded it imposed the so-called baisse Blum: they rolled back prices by 5% at the beginning of 1947 and froze them at that level, and then mandated another 5% price decline in March. In other countries, controls and rationing, while not universal, were still pervasive. At the end of 1948, bread was rationed in 14 of 21 European countries, butter in 15, meat in 15, sugar in 15, coffee in 12, tobacco in 5, coal in 11, textiles in 11, and gasoline in 14 (UN, 1950, p.56). While prompting the growth of black markets, controls discouraged transactions at official prices. The monetary overhang, resulting from the fact that money supplies had increased more rapidly than prices, threatened renewed inflation at any time. With budget deficits deep in deficit, investors were hesitant to purchase government bonds. Inflation consequently threatened to become an explosive spiral rather than a one-time event. Anticipating that prices were soon to rise and that financial assets might lose their purchasing power, producers had every incentive to hoard commodities rather than delivering them to market. Farmers refused to market their produce so long as prices were restricted to artificially low levels. With their receipts vulnerable to inflation, they were better off feeding grain to their livestock. The post-World War II food shortage in many European countries reflected not just bad weather in 1947 but the reluctance of farmers to deliver food to the cities.¹² The manufactured goods farmers might have purchased remained in

short supply. Industrial enterprises had the same incentive to hoard inventories. So long as these shortages persisted, workers had little reason to devote their full effort to market work.

There is no better way to substantiate this point than to quote a neglected passage from Marshall's (1947) Harvard speech itself.

"There is a phase of this matter which is both interesting and serious. The farmer has always produced the foodstuffs to exchange with the city dweller for the other necessities of life. This division of labour is the basis of modern civilization. At the present time it is threatened with breakdown. The town and city industries are not producing adequate goods to exchange with the food producing farmer...The farmer or the peasant cannot find the goods for sale which he desires to purchase. So the sale of his farm produce for money which he cannot use seems to him an unprofitable transaction. He, therefore, has withdrawn many fields from crop cultivation and is using them for grazing. He feeds more grain to stock...Meanwhile, people in the cities are short of food and fuel...."

Many other examples could be cited. On January 5, 1947, the New York Times noted that "It has been a fact for some time that [French] peasants have not been delivering their products to market because of lack of confidence in the money they would get for them." In its issue of March 1, 1947, The Economist commented that the "main enemy" of French policymakers was the French farmer, "whose distrust of his currency makes him loth [sic] to send his produce to market -- or at least to the controlled market."¹³ Its issue of October 18, 1947 reported that:

For more than two months now Parisians have been eating yellow bread. Despite the substantial tonnages of wheat imported into France since the autumn of 1946 and the long prewar years of development towards a position of self-sufficiency in wheat, France has now been forced to turn to maize, and the French officials are seeking large imports of cereals again during the next twelve months...One reason for this position is found in the weather of last winter and spring; another in the shortage of tractors, horses and implements. But perhaps the most important reason lies in French policies on prices and control of marketing during the last few years.

The article then discusses how French wheat prices were kept below world price levels, how the policy of controlling the prices of consumer goods had greatly increased the nominal purchasing power of working-class wages, but how this caused foodstuffs to be in short supply. "The peasant, unable to purchase consumer goods and losing confidence in the currency, eats more himself and feeds wheat to his animals."¹⁴

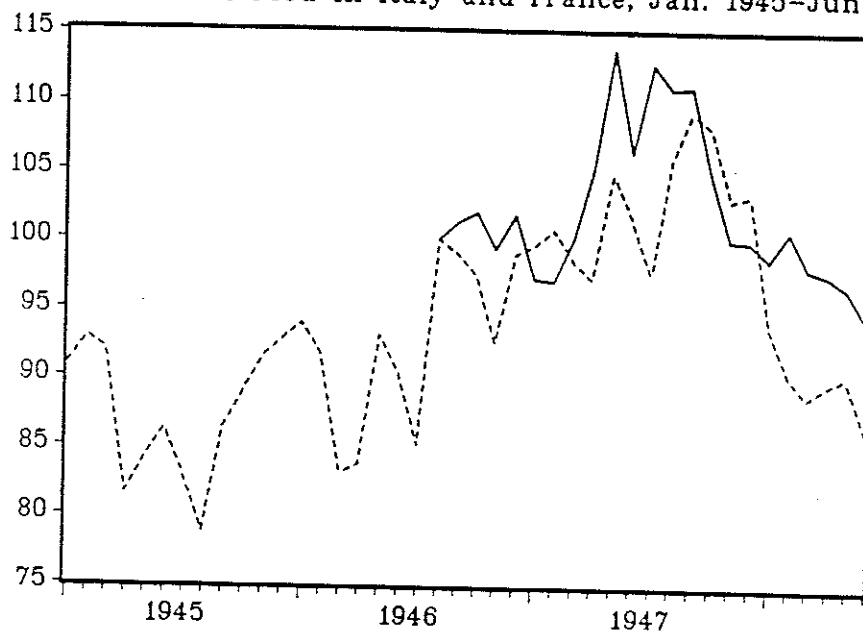
Four separate bodies of evidence support this interpretation. First, the behavior of food prices is consistent with the view that producers with the opportunity were withholding goods from the market. Farmers, as described above, had exceptional scope for responding to shortages of consumer goods and the threat of inflation by holding back produce and feeding it to their livestock. In both France and Italy the relative price of foodstuffs consequently rose during the period of shortage and financial chaos, but fell during the stabilization. Figure 6 shows that much of the rise in food prices in France occurred before the cold winter of 1946-7, as if the problem was more hoarding than prospects of a poor harvest. It also shows a fall in both countries in the relative price of food following the announcement of the Marshall Plan, even though it is hard to find any evidence of "news" about the harvest.

Second, the recovery of perishable and nonperishable agricultural products support the interpretation. Grain and potato supplies recovered more quickly than those of meat, as farmers held off slaughtering their livestock. The output of meat remained depressed despite that by early 1947 cattle were as numerous as before the war.¹⁵

Third, movements in inventories of raw materials and manufactured goods are consonant with this view. Though the prevalence of controls was greatest

Figure 6

Relative Price of Food in Italy and France, Jan. 1945-June 1948



Notes: August 1946=100. Wholesale prices for France, retail prices for Italy

— ITALY - - - - FRANCE

on foodstuffs, other prices were also controlled, leading firms to hoard stocks. In Italy, the value of inventories rose by 2 billion lire in 1946 and by 9 billion lire in 1947, but declined by 1 billion lire in 1948 (Casella and Eichengreen, 1991, Table 4). In France and Britain inventories of virtually every major good for which data on stocks are available declined following announcement of the Marshall Plan.¹⁶

Fourth and finally, governments' own policies substantiate the picture of unsustainably low prices giving rise to shortages. In France, Ramadier attacked speculators who were hoarding stocks and withholding goods from the market. He attempted to use the National Council of Credit, a body controlling the nationalized banks, to deny loans to holders of excessive stocks.¹⁷

4.2 Policy Uncertainty and the Value of Waiting

A dramatic change in the economic environment was imminent, but uncertainty about its nature remained pervasive. The immediate postwar period in many European countries was marked by protracted disputes between the Center-Right and Left. In Italy, for example, the Liberals and Christian Democrats favored fiscal discipline and abolition of subsidies and price controls, while the Socialists and Communists favored capital taxation and extensive social spending. Italian government was by coalition, and until May 1947 Communist ministers controlled the budget. This did not make likely cuts in social spending to balance the budget. At the same time, parliamentary representatives of propertied classes had sufficient leverage to block initiatives designed to balance the budget through confiscatory capital taxation.

In France, coalition governments were "perpetually subjected to both political and economic pressures from different sections of the population, whose demands were often equally urgent and at the same time totally irreconcilable" (Pickles, 1953, p.59). Having won 185 seats in the 1946 elections, the French Communists were the single largest party in the Assembly. The Socialists occupied an intermediate position between the Communists on the one hand and the Radicals and the clerical party, the Mouvement Republicain Populaire, on the other. Like their Italian counterparts, the French Socialists were "committed to a directed economy and increases wages for hard-hit workers, while the Radical Socialists have campaigned for moving as rapidly as possible toward freedom of enterprise...." (US State Department, 1948a, chapter V, p.37). To balance the budget, the left-wing parties favored a capital levy, their more moderate counterparts cuts in social spending.

Uncertainty surrounding the outcome of this struggle increased the option value of waiting. Investors were reluctant to buy securities, not knowing whether they would be taxed away. Creditors were reluctant to loan money for any length of time, not knowing whether its value would be inflated away. Workers were reluctant to commit to training or apprenticeship programs or to accept positions in which compensation was deferred, not knowing whether the structure of pay would be changed and job security would be threatened. Absenteeism was rampant.

Alexander (1991) documents the debilitating effects of policy uncertainty in Germany. In the immediate postwar years, uncertainty emanated from the policies of the Allied occupiers, whose goals were included dismantling factories that had been integral to Germany's war effort and breaking up the

cartels and combines that had been central to the highly-concentrated industrial sector. Until it was known which factories would be dismantled and which firms would be "deconcentrated," investors held back. Moreover, until it was known whether the lead in the Bizone would be taken by the free-market-oriented U.S. or by the British, whose Labour Government was nationalizing industry at home, property rights remained uncertain. Until the blockade of Berlin, there was even the possibility that Germany's postwar reconstruction would take place only after the four occupied zones had been reunified, which would have spread Soviet influence to the Western zones and lengthened the shadow over private property.

Subsequently, however, uncertainty emanated from the clouded political outlook. The single largest German political party, the Social Democrats, advocated nationalization and the maintenance of controls. Its principal opponent, the Christian Democratic Union, preferred a market economy with a social safety net. Which party would dominate was far from clear. As American officials observed, this uncertainty about the nature of the regime created "a general hesitancy to make any decisions at all" (cited in Alexander, 1991).

4.3 Resolving the Crisis

Solving the crisis was straightforward. Prices had to be decontrolled to coax producers to bring their goods to market. Inflation had to be halted for the price mechanism to operate smoothly. Wage demands had to be moderated to relax the profit squeeze on firms and remove demands for government subsidies. Budgets had to be balanced to reduce inflationary pressure. With financial

stability restored and market forces given free rein, individuals could direct their attention to market work.

If the solution was clear, why then was it not adopted? The economic model that best answers this question is the war-of-attrition model of Alesina and Drazen (1989). The idea is as follows. Suppose that the sum of notional demands for the national income exceeds 100% and that government is the residual claimant for money income. Demands for transfers exceed the taxes the government can collect. The budget deficit is financed by printing money, and open or repressed inflation results.

Now assume that the burden of stabilization, in the form of policies reducing some group's share of the national income, is unevenly distributed. The group conceding first incurs the larger share of the costs. If rival factions differ in their ability to shoulder the costs of inflation and shortages, yet are uncertain about the cost-bearing capacity of the others, each will refuse to concede, hoping to outlast the others.

Over time, the costs of inflation and/or shortages rise, and with them the perceived probability that the other factions are in fact more patient. Ultimately, the distributional interest least able to bear the costs concedes, and stabilization occurs. Even if inflation is finally halted by the adoption of policies identical to those deemed unacceptable initially, delay is rational. Different groups still have an incentive to hold out as long as the costs of stabilization are borne unevenly and there is uncertainty about the staying power of their rivals. Until they concede, the probability that others will concede first and bear the costs of stabilization is sufficient to justify the ongoing loss from inflation and shortages.

The distributional nature of the postwar crisis is clearest in the case of France. Successive strike waves punctuated calendar year 1947. When the baisse Blum failed to hold, a strike broke out spontaneously in the Renault works, attracting the support first of the CGT and then of the Communist Party. When the Communist ministers urged the Ramadier Government to reverse its opposition to the strikes, Ramadier dismissed them. The critical question was whether the Socialists would also oppose the policy of pressure for wage moderation, or agree for the first time to support a government that did not include the Communists. Having suffered inflation and financial turmoil for nearly two years, they finally gave in. Real wages then fell continuously through 1950 and unemployment rose, together reflecting labor's acceptance of a smaller distributional share.

Similarly, by the spring of 1947 Italian political leaders agreed that open and repressed inflation were out of control, but they disagreed on policies with which to redress it. The Left favored credit controls to squeeze the speculators regarded as responsible for the inflation, while the Right favored fiscal austerity. In April-May 1947 Alcide de Gasperi, the Christian Democratic leader and Italian premier, dissolved the existing coalition and formed a minority government that survived with the support of the small parties. This new government represented a clear shift to the right. The Communists moderated their opposition, hoping that they might be able to re-enter the government in the future. de Gasperi imposed a variety of austerity measures, and unemployment rose dramatically, again reflecting the extent to which the costs were borne by the Left.

Thus, solving the marketing crisis was a problem of political economy, not just a problem of economics. As The Economist put it in a discussion of

the crisis in France, "Strictly speaking, the economic answer to all these problems is known -- to increase taxation, to ensure investment, to cut state expenditure, to balance the budget and to restore confidence in the franc. But the political answer is one that has eluded Frenchmen for the last thirty years" (The Economist, July 26, 1947, p.138).

The Marshall Plan played a critical role in ending the war of attrition. It did not obviate the need for sacrifice. But it increased the size of the pie available for division among competing interest groups. Two-and-a-half percent -- Marshall aid as a share of recipient-country GNP -- was not an overwhelmingly large change in the size of the pie. But if the sum of notional demands exceeded aggregate supply by 5 or 7 1/2%, Marshall Plan transfers could reduce the sacrifices required of competing distributional interests by a third or a half. They could significantly reduce the costs of compromise relative to the benefits.

In both France and Italy, announcement of the Marshall Plan was accompanied by the exit of Communist ministers from the governing coalition and by the adoption of tax increases and expenditure reductions designed to move the budget toward balance. Subsidies on consumer goods were reduced. Workers moderated their demands for higher wages and government transfers. With the elimination of repressed inflation, goods returned to the market.

This role for the Marshall Plan was acknowledged by contemporaries. In July 1947, less than two months after Marshall's Harvard speech, The Economist (July 26, p.138) noted that the workers were tiring of political strikes and that the unions of the Left were showing new signs of moderation. To again quote its analysis of France:

"In theory, the economic assistance possible under a Marshall Plan might turn the scale between stability and further disintegration

next winter. American assistance could pursue a double policy in attacking the basic problem -- lack of confidence in the franc. The provision of dollars or gold could underpin the currency and imports of consumer goods could begin to create a corrective process by tempting food and goods [to] market, restoring the purchasing power of wages and increasing the incentive to produce more."¹⁸

It was not inevitable, of course, that the nations of Western Europe would accept this bargain. Marshall aid was offered to Eastern Europe and even to the USSR. Moscow's rejection of the offer can be understood as unwillingness to allow the US to sidetrack its progress along the road of central planning. It is critical to acknowledge that the price the US charged for its aid was a price that Western Europe might have paid for its own sake in any event. Support for the market was already widespread; the Marshall Plan only tipped the balance.

5. The Role of Conditionality

The conditions attached to American aid maximized the likelihood of this outcome. Yet some kinds of conditions were more effective than others. American demands that European governments meet specific fiscal and monetary targets were less successful than pressure for price liberalization and economic integration.

[Box 3 about here]

A number of techniques were used to achieve these ends. First, each recipient was required to sign a bilateral pact with the US agreeing to balance government budgets, restore internal financial stability, and stabilize exchange rates at realistic levels. Second, each expenditure of Marshall Plan funds had to be negotiated with the American authorities, a process which afforded the ECA opportunity to influence domestic policy. (For example, the Americans reacted to increasing British government involvement in

housing construction by cutting Marshall Plan lumber imports.) Third, for each dollar of Marshall aid, the recipient government was required to place a matching amount of domestic currency in a counterpart fund to be used for purposes approved by the US. Each dollar of Marshall Plan aid thus gave the donor control over two dollars' worth of real resources. In many instances, the US insisted that these funds be used to buttress financial stability by retiring public debt. (See Table 7.) In others, the US authorities prevented the European government from making any use of its counterpart funds at all.

US pressure also operated informally. Marshall Plan administrators took a variety of ad hoc steps to encourage price decontrol and discourage nationalization. For example, they viewed with alarm British schemes for unifying and nationalizing the coal industries of the Ruhr, then part of the British zone of occupation. Such schemes were dropped once ECA administrators made their opposition known. Similarly, Hoffman lobbied against the nationalization of the British steel industry and at least delayed this eventuality.

Washington, D.C. pressed continuously for economic integration. Each aid recipient was required to develop a schedule for liberalizing its foreign trade. The recipient governments were forced to decide among themselves the international allocation of US aid and to coordinate their national recovery programs so as to insure that their combined current account deficits vis-à-vis the dollar area did not exceed the aid the US was willing to make available. Their discussions, in conjunction with US pressure, led to the formation of the CEEC and the OEEC, way-stations along the route to the Schuman Plan, the European Payments Union and the EEC.

Table 7. MSA/ECA Approvals for Withdrawal of European Counterpart Funds Available for Country Use by Purpose and Country, Cumulative, April 3, 1948 - June 30, 1952
(Dollar equivalents of local currencies, in millions of dollars)

Promotion of Production

Country	Total for Production	Electric Gas & Other Power	Transportation & Communications	Agriculture	Manufacturing	Mining	Other Production
TOTAL	4,466.3	1,025.5	957.5	817.6	681.7	481.8	502.2
Denmark	62.4	.6	2.8	11.2	6.7	--	41.1
France	1,925.6	738.4	294.2	234.1	249.2	340.6	69.1
Germany	753.7	182.6	86.8	70.7	218.7	91.8	103.1
Italy	823.8	1.0	348.9	204.8	22.6	--	246.5
Netherlands	212.8	--	13.6	166.5	32.3	--	.4
Norway	8.4	--	2.7	--	--	5.7	--
Turkey	51.0	.6	13.9	15.2	8.0	14.7	4.6
United Kingdom	2.2	--	--	.2	--	--	2.0

For Other Purposes

Country	Monetary and Financial Stability	Housing & Public Buildings	Construction Production % Procurement	Other	Total Approved for Withdrawal
TOTAL	2,583.3	767.5	460.9	373.3	8,651.3
Denmark	130.1	--	9.4	2.2	204.1
France	171.4	314.4	283.9	7.5	2,702.8
Germany	--	97.7	--	157.7	1,009.1
Italy	--	172.7	--	45.9	1,042.4
Netherlands	197.4	88.1	46.3	3.0	547.6
Norway	292.7	--	--	--	301.1
Turkey	--	--	60.4	11.0	128.4
United Kingdom	1,706.7	--	47.5	6.4	1,762.8

Adapted from Table C-12, p. 13, Mutual Security Agency, Report to Congress, December 1952 (seven smaller countries' approvals not shown). Drawn from Mayer (1969), p. 87.

The question is how successful US conditionality ultimately proved to be. While much of the older literature (viz. Price 1955; Arkes 1972) uncritically accepts the importance of conditionality, some recent revisionists (e.g. Esposito 1985, Wall 1991) dismiss it as ineffectual. In our view, this dispute reflects the different countries and issues upon which these authors focus.

That there were limits on what could be achieved by conditionality is apparent even from the bilateral agreements that were a prerequisite for the receipt of aid. These agreements were the subject of protracted negotiations. London and Paris acceded to American demands to control the allocation of counterpart funds but resisted giving Washington control over their monetary and fiscal policies. An American-authored provision allowing the IMF to veto European exchange rate changes was eliminated. So was a provision that would have given the US first call on strategic materials possessed by the recipients.

American demands for measures to balance budgets and restrict domestic credit creation also led to extended negotiations and, sometimes, political crises. Repeatedly, the US demanded tax increases, expenditure reductions and new restrictions on domestic credit creation. It threatened to impound counterpart funds unless these steps were taken.

Table 8 shows the course of Franco-American negotiations over French macroeconomic policies. Strictly speaking, the US failed to achieve its stated targets. Not only is there no quarter in which the US target was fully met, but there was no quarter in which release of counterpart funds was actually suspended.

Table 8

U.S. Conditionality in France, 1948-50

Quarter	American Demand	French Response
1948-I	Refrain from inflationary finance.	Fix 200 billion franc ceiling on Bank of France advances.
1948-II	Eliminate budget deficit, end use of Bank of France advances to cover budget deficit.	None.
1948-III	Eliminate budget deficit, end use of Bank of France advances to cover budget deficit.	Increase taxes on tobacco, and income, increase postal rates, impose credit controls.
1948-IV	Pass balanced budget for 1949, maintain credit controls.	Reduce ceiling on Bank of France advances to 175 billion francs, limit government expenditure.
1949-I	None.	None.
1949-II	Eliminate prospective 100 billion franc budget deficit.	Increase gasoline tax.
1949-III	None.	None.
1949-IV	Eliminate prospective 120 billion franc budget deficit, do not increase ceiling on Bank of France advances.	New taxes imposed, capital controls maintained, advances ceiling left unchanged.
1950	Invest 20 billion francs in low cost housing.	20 billion francs invested in low income housing.

Yet if the ECA's stated target is viewed as the opening bid in a bargaining game, there is reason to think that conditionality still had some effect. Stated targets were not achieved, but concessions were obtained. French budget deficits were smaller and monetary policies were less inflationary than they would have been otherwise. Analysis of a variety of episodes leads to this conclusion. For example, in the autumn of 1948, when the US threatened to withhold counterpart funds, Prime Minister Henri Queuille moved to impose new taxes and to raise the prices of transport, postage and tobacco. The loi des maxima of December 1948 did much to stabilize the French public finances (Wall, 1991, pp.163-169). Although the Americans were not fully satisfied with the outcome, it is likely that more movement in the direction of budget balance occurred than would have in the absence of American intervention.

In other countries, American conditionality operated more powerfully. In Italy, counterpart releases were delayed. Italian economic policy was modified. As James Clement Dunn, the American ambassador to Italy, put it, "He who controls the so-called lire fund will control the monetary and fiscal, and in fact the entire economic policy of Italy" (cited in Hogan, 1987, p.152). In Greece, the US withheld the release of counterpart funds because it felt that the economy was operating under excessive pressure of demand. American control over economic policy was extensive. The treaties signed in conjunction with the extension of Marshall aid explicitly gave the US supervisory powers over domestic as well as foreign resources. The treaties "ensured that no economic or military decision of any consequences could be taken by the Greek Government without the prior approval or consent of the US Administration or its representatives in Athens" (Freris, 1986, p.130).

What accounts for these different outcomes? American conditionality was least effective in countries that were strong fiscally and large economically. France and Britain were in a stronger fiscal position than Greece. Britain's fiscal position was sufficiently secure that she required no counterpart releases for investment in housing or industrial investment.

Brown and Opie (1953) conclude that countries like Britain utilizing counterpart funds to retire public debt eluded the influence of the ECA, but that for other countries counterpart releases gave US administrators significant leverage. Regression analysis supports this speculation. We added to the basic growth equation estimated in Appendix C counterpart funds withdrawn for "productive purposes" (the ECA term for funds spent on investment or the purchase of inputs). We found that a Marshall Plan allotment of 2% of GNP would have raised output by 7.5 per cent in the next year if and only if the matching 2% of GNP was withdrawn from the counterpart accounts for use in production. Otherwise, output would have risen not by 7.5 per cent but by 4.7%.¹⁹ Clearly, US decisions regarding the counterpart accounts mattered for recipient-country welfare and endowed US policymakers with leverage.

The other factor affecting the leverage exercised by US conditionality was the size of the recipient country. France's fiscal position was more tenuous than Britain's, but her economy was large and therefore critical to European recovery. It was more costly to provoke an economic crisis in large countries like France that played a central role in the European economy than in smaller countries like Italy. French officials, aware of this fact, played this card to their advantage.

Where political support was closely divided between Left and Right, extreme monetary and fiscal austerity might undermine Socialist support for moderate governments, leading to their downfall and playing into the hands of the Communist Party. This was especially true when austerity measures could be blamed on American interference. French politicians invoked this danger repeatedly. They warned that acceptance of American demands would lead to the government's downfall; acknowledged the warning, the Americans moderated their demands. In contrast, in countries where centrist governments were more firmly entrenched, the threat that conditionality would create political instability was less credible.

If the overall record of conditionality regarding fiscal and monetary policy was mixed, informal pressure for market liberalization and economic integration was more successful. These more abstract principles were less intimately connected to the public purse. Their distributional consequences were less transparent. Hence they were less likely to occasion a government's downfall or provoke complaints of American intervention. As a condition for receiving Marshall aid, each country was required to develop a program for removing quotas and other trade controls. Even where domestic markets were highly concentrated, competition could be injected via international trade. Government intervention and other efforts to interfere with the operation of markets would be disciplined by foreign competition. American insistence that aid recipients coordinate their national recovery programs led to regular meetings of the OEEC and to increasingly frequent bilateral consultations. They culminated in the creation of the Coal and Steel Community and the European Payments Union.

6. Enduring Effects

The evidence presented so far indicates that the Marshall Plan initiated Europe's recovery from World War II earlier than otherwise. Less certain is whether US aid had a permanent impact on the level of output.

Theory provides no presumption about whether the Marshall Plan's output effects were permanent or not. In Appendix D we analyze two growth models, one in which the output effects of a temporary foreign aid program are transient, the other in which they are permanent. In the first, a variant of the well-known Solow Model, the steady state level of output per capita depends exclusively on parameters like the population growth rate, the rate of time preference, and the rate of technological change. Since there is no reason why an injection of foreign aid should affect any of these parameters, there is no reason why it should permanently affect the level of output. If the aid arrives when the capital/labor ratio is below normal levels, then the fact that some part of the transfer is invested will allow the capital/labor ratio and output per person to rise toward their steady-state values faster than otherwise. But since their ultimate destination is the same -- i.e. the steady state is unchanged -- faster growth initially implies slower growth subsequently. The impact of aid on the level of output is temporary.

In contrast, endogenous growth models like those of Romer (1990) include channels through which a temporary injection of foreign aid can permanently affect the level of output. The impact on growth can be positive initially without being reversed subsequently. The critical assumption that differentiates these models from the Solow Model is that, because there are no diminishing returns to capital, a one-time injection of foreign aid which raises the capital/labor ratio therefore raises output and savings

proportionately. The higher capital/labor ratio can be fully financed with higher savings, so that the level of output can remain higher permanently. There is no tendency for the acceleration of growth that takes place in the short run to be given back through slower growth later.

To test whether the growth effects of US aid were temporary or permanent, we analyzed quarterly data on industrial production and receipts of US foreign aid from 1948 through 1955 for the 10 principal beneficiaries of the Marshall Plan. We regressed the level of industrial production on three lags of itself and on three lags of foreign aid receipts.²⁰ For none of the ten countries considered could we reject at standard confidence levels the null hypothesis that the three lagged values of foreign aid summed to zero. Unfortunately, the coefficient estimates were imprecise, so neither was it possible to reject a range of other hypotheses. We therefore constrained the coefficients on the three lags of foreign aid to be the same across countries and estimated the ten equations jointly. The coefficients on foreign aid were then quite precisely estimated.²¹ They showed a positive impact effect followed by a negative subsequent effect. The three lagged terms summed to zero.²²

These findings are consistent with the predictions of the Solow Model rather than with those of endogenous growth models in which temporary foreign aid can have permanent effects. According to this evidence, recovery commenced earlier than it would have otherwise, but the Marshall Plan did not have enduring effects.

Still, one wonders whether American aid had enduring effects of a subtler nature. Perhaps the Marshall Plan permanently affected European economic growth in ways that were uncorrelated with the time profile and magnitude of foreign aid receipts. If so, its enduring effects would not be captured by

econometric techniques that depend for their power on time-series correlations.

This would be the case, for example, if the Marshall Plan provided the solution to a coordination problem. Imagine that European labor and management were faced with choosing between two equilibria after World War II. In one -- the interwar equilibrium -- each faction tried to maximize their current share of national income. Intense distributional struggles would have produced wage inflation, a profit squeeze, low levels of investment and lagging productivity. In the other -- the postwar equilibrium -- all parties agreed to trade current compensation for faster longer-term growth and ultimately for higher living standards. Workers deferred their wage demands, management its demands for higher profits. Higher investment and faster productivity growth ensued, ultimately rendering everyone better off.²³

The second equilibrium could be attained only if all parties coordinated on it. If workers pressed for higher wages, management had little incentive to plough back earnings in return for the promise of higher future profits. If management failed to plow back profits, workers had little incentive to moderate wage demands in return for the promise of higher future living standards. If workers and management in some sectors refused to follow policies of moderation, reducing the supply of investible funds to the economy, those in other sectors had less incentive to do so.

The Marshall Plan could have shifted Europe from one equilibrium to the other. Until 1948, European labor-management relations were conflictual. Pressures for real wage increases were intense. At that point, the Marshall Plan administrators urged European unions and governments to focus on raising productivity rather than current compensation (Maier 1977). They pressured

governments to adopt a variety of investment-friendly policies (Esposito, 1985). European nations had an incentive to shift to the high investment, deferred-compensation equilibrium in order to obtain Marshall aid. Once there, they had no reason to deviate.

The two most prominent features of the dramatic acceleration in European growth that began in 1948 and lasted for more than two decades -- high investment rates and wage moderation -- are consistent with this interpretation. The investment share of GNP in Europe was nearly twice as high as it had been between the wars (see Table 9). Labor's share of national income was stable or falling. Workers consciously allowed real wage increases to lag behind productivity to provide the incentives and resources for investment. In Britain, for instance, the Trades Union Congress cooperated with management and with the Conservative Governments that ruled from 1951 through 1964, deliberately moderating their wage claims (Flanagan et al., 1983, p.377). In the Netherlands, unions allowed wages to lag behind productivity in the 1950s "so that industry could earn profits which would pay for expansion and modernization of the productivity apparatus."²⁴ Industrial relations specialists like Barkin (1983, p.21) lay great stress on this growth-oriented consensus.

Of course, one can think of other explanations for the high investment rates and labor-market flexibility that characterized Europe's first two postwar decades.²⁵ But the fact that dramatic shifts in the pattern of investment and in labor market conduct both surfaced during the Marshall Plan years lends credence to the explanation emphasizing the American program as a solution to a coordination problem.

Table 9

Non-Residential Fixed Investment
as Percent of GNP at Current Prices

	Average of ratios for years cited		
	1920-38	1950-60	1960-70
Austria	6.1 ^a	16.4	20.2
Belgium		12.4	15.5
Denmark	8.9	14.0	16.9
Finland		19.6	20.0
France	11.8	13.7	17.4
Germany	9.7	16.1	19.3
Greece	7.5 ^b	11.7	18.2
Ireland		13.1	15.1
Italy	13.6	15.1	14.5
Netherlands		18.0	20.3
Norway	12.4	23.7 ^c	23.8 ^c
Sweden	10.5	15.5	17.3
Switzerland		14.1	20.0
UK	5.7	11.6	14.2
Average for Western Europe	9.6	15.4	18.1

^a 1924-37.

^b 1929-38.

^c Includes some elements of repair and maintenance excluded by other countries.

Source: Maddison (1976), p.487.

7. Implications for Eastern Europe and the Soviet Union

Are conditions like those that made the Marshall Plan a success present in Eastern Europe and the USSR today? Consider first the Soviet predicament. As in Europe in 1947/48, ceilings on food prices are discouraging cultivators from bringing their produce to market.²⁶ As in Europe in 1947/48, the traditional division of labor between town and country has broken down; not just the fuel, fertilizer and tractors required for agricultural production but the televisions, refrigerators offered as incentives to farmers have not been made available. Shortages of consumer goods are increasingly pervasive, as enterprises hold back stocks in anticipation of higher prices once controls are relaxed. Workers hold back effort until policy uncertainty is resolved.²⁷ Excess liquidity and government budget deficits create the specter of rampant inflation.

As in postwar Europe, foreign aid could help in principle to resolve these problems. Support for Soviet living standards could contain public opposition to economic reform if output falls during the transition to a market economy. Hard currency would enable the USSR to import much-needed equipment from the West or, better still, from its Eastern European neighbors. Reserves of foreign exchange would enable the authorities to stabilize the ruble once it is rendered convertible.

Equally, very important differences weaken -- in our view, seriously -- the case for a Marshall Plan for the USSR. In postwar Europe there existed widespread support for the market economy. The Marshall Plan only tipped the balance. The social contract upon which the subsequent generation of prosperity was based was a compromise between positions that were only a

moderate distance apart. Hence a modest side payment could make the difference between chaos and stability.

The same is not true of the USSR today. Powerful elements in the government and military -- certainly not all of which were eliminated by the failure of the August coup -- oppose serious economic reform. Much of the public understands only dimly what a free market entails. The choice is not between a heavily regulated mixed economy and a lightly regulated mixed economy, or between a distributionally neutral fiscal system and a moderately redistributive fisc, but between public and private property and between prices and commands. With the cleavage between views so pronounced, it is unlikely that a limited amount of foreign aid would significantly speed the emergence of a consensus favoring rapid liberalization.

In postwar Europe, the administration of US aid encouraged the reductions in government spending needed for financial stability. It is far from certain that aid for the USSR would have the same effect. Aid transfers to Moscow could place additional resources in the hands of the very individuals most opposed scaling back the public sector, accelerating privatization and creating a market economy. Aid to the center will strengthen it vis-à-vis the Republics, delaying the ultimate devolution of power.

For those committed to aid, these arguments highlight the need for conditionality, and specifically for conditioning aid on actions rather than promises. An area in which there exists a special opportunity for conditionality is relations between the Soviet and the Republics. Disputes among them threaten to derail the reform process. Clearly apportioning jurisdiction between the central government and the Republics is necessary before significant private investment (notably foreign investment) can get

underway. Free trade among the Republics will speed reform; otherwise comparative advantage will be squandered, local monopolies will gain power, and traditional economic relationships will be disrupted.

Intervening in this process through the administration of aid might be regarded as meddling in the domestic politics of another country. Recall, however, that after World War II the US laid down as a condition for aid that the recipients collectively decide on the allocation of the funds. Trade liberalization and economic integration were explicit conditions of Marshall Plan aid. The OEEC and the EEC -- two examples of the type of loose federations to which the Republics aspire -- were established in response to this impetus. What worked once could work again. There is no reason why the United States and the EC could not require the Republics and the Soviet to jointly negotiate the formula according to which foreign aid would be allocated. The donors could make free trade among the Republics, or at least a payments union agreement, a condition for the receipt of Western aid, and press for establishment of a fiscal system like the US and other federal entities possess.

More specific forms of conditionality are more problematic. In principle, quarterly targets could be set for number of farms and firms privatized, number of goods freed from tariff or quota, and progress on the fiscal and monetary fronts, with the release of aid conditioned on whether those targets are met. America's experience with the Marshall Plan indicates that such conditionality, while sure to produce controversy, can also produce results. But experience with the Marshall Plan suggests as well that aid conditioned on nuts-and-bolts issues of everyday politics is more likely to provoke a firestorm of protest and to backfire on the donor than is aid

conditioned on high principles like openness and integration. A lesson of the Marshall Plan is that specific monetary and fiscal targets are especially difficult to impose on a large country to which the prosperity of an entire region (in this case Eastern Europe) is linked.

In Eastern Europe, the situation is simpler. In most cases, the central government remains a logical recipient of the foreign aid. In some countries a commitment to liberalization and meaningful reform already exists. But hard times threaten to fuel opposition. We believe that there exists a strong case for foreign aid to Eastern European countries precisely in order to minimize this danger. So long as reform continues, aid to solidify support for current programs by easing the transition, however slightly, can only help. Its extension must still be made contingent upon conditions, but if this is done it is hard to see how aid could be counterproductive.

One final caution. In postwar Europe, foreign aid could promote adjustment and growth because Europe had experience with markets and possessed the institutions needed for their operation. Property rights, a bankruptcy code and courts to enforce contracts, not to mention generations of accumulated entrepreneurial skills -- were all in place. None of this is true of the USSR today, and as yet it is true of only parts of Eastern Europe. Even under the best circumstances the donors should therefore not expect that the impact on economic growth will match that of the Marshall Plan.

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Appendix A

A Three-Gap Model for Analyzing the Macroeconomics of Foreign Aid

To analyze the macroeconomics of foreign aid, we utilize the two-gap model of Chenery and Bruno (1962), as extended by Bacha (1990) to incorporate fiscal constraints on public capital formation. Our formulation has much in common with the treatment of McKinnon (1964).

We start with the savings-investment identity for an open economy:

$$S - I = X - M \tag{1}$$

where S is saving, I is investment, and X and M are exports and imports of goods and services. Imports are of two types: consumption goods M_c and capital goods M_k .²⁸ (Abstracting from changes in relative prices, we set all prices to unity.) The balance of payments, which is the current account plus net capital transfers F , must equal zero. (We treat net transfers interchangeably with foreign aid because significant foreign borrowing was not possible in the immediate postwar years.)

$$X - M_c - M_k = - F \tag{2}$$

Domestic production is a function of the capital stock:

$$Y = \alpha K \tag{3}$$

A fixed fraction of investment requires imported capital goods:

$$M_k = m_k I \tag{4}$$

where I is investment. In addition, a fixed fraction of investment must take the form of public capital formation G_k :

$$G_k = g_k I \quad (5)$$

where g_k (like m_k) is taken as less than one.

To keep the model simple, we adopt the following functional forms for the behavior of the household and government sectors. Aggregate savings S is a linear function of national income in excess of consumption necessary for subsistence:

$$S = s(Y + F - C) \quad (6)$$

where s is the savings rate and C is subsistence consumption. Total tax revenues T depend on the tax rate on income above subsistence t_y and the share of foreign aid accruing to the government t_f :

$$T = t_y(Y - C) + t_f F \quad (7)$$

The government budget constraint is:

$$G_k + G_c = T + D \quad (8)$$

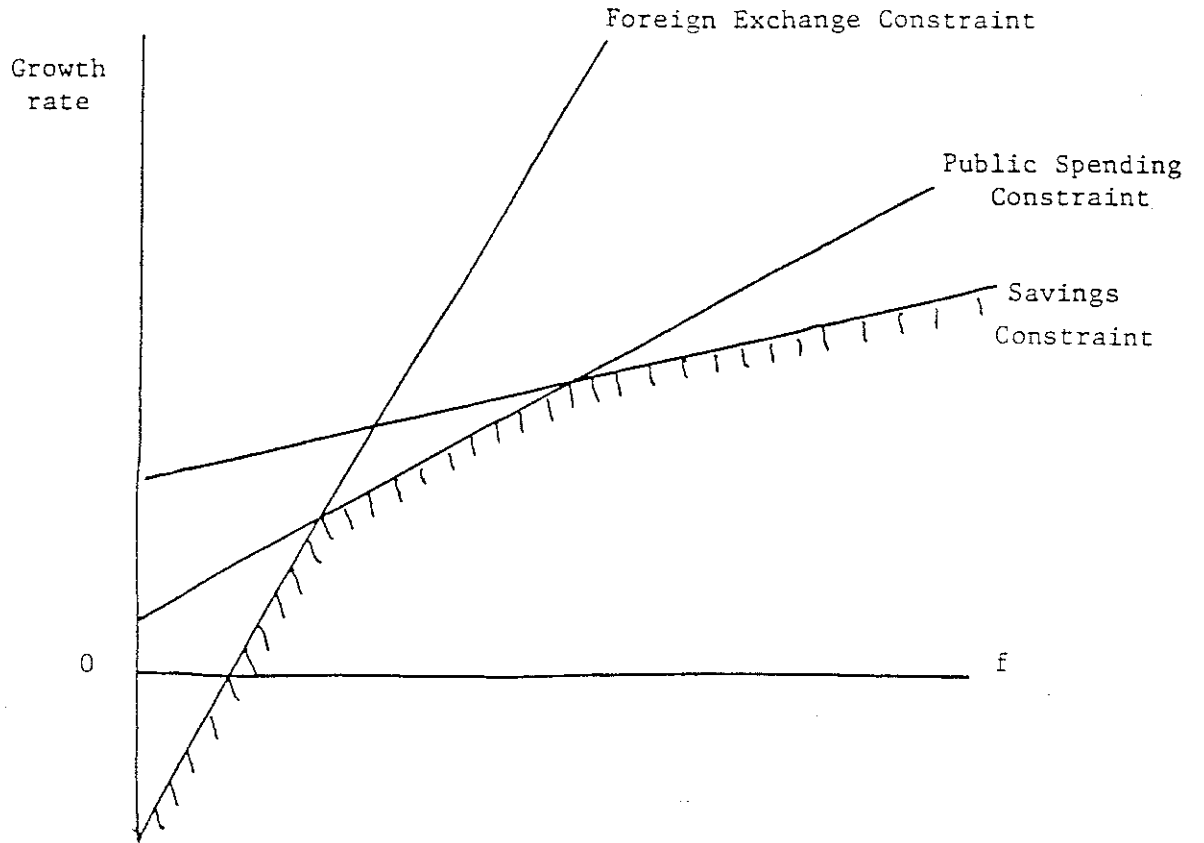
G_c is the exogenous level of government consumption and D is the exogenous level of government spending financed from sources other than current taxation. For simplicity, we set $D = 0$.

Eq. (1) can be solved for the relationship between the rate of growth γ ($\gamma = I/K$) and foreign aid as a share of GDP (denoted f , $f = F/Y$):

$$\gamma = [\alpha/(1-m_k)] [-x + s(1+f-c) + m_c] \quad (9)$$

where x is the export share of GDP ($x = X/Y$) and c is subsistence consumption relative to GDP ($c = C/Y$). This relationship has a positive slope ($\alpha s/(1-m_k)$) and intercept as depicted in Figure A1. It shows the familiar McKinnon-style

Figure A1



relationship between aid and growth in an economy whose growth is constrained by a low level of saving. The innovation here is that the intercept can shift, and with it the likelihood that the savings gap binds, as the economy moves further from subsistence. If the savings gap binds, then $\delta\gamma/\delta f = s\alpha/(1-m_k)$.

Similarly, eq. (2) can be solved for the relationship between growth and aid:

$$\gamma = (\alpha/m_k)[x - m_c + f] \quad (10)$$

This is the relationship between growth and aid in an economy constrained by the availability of imported capital goods. Eq. (10), the foreign exchange constraint, is steeper than eq. (9). Its intercept is negative if $m_c > x$, which is appropriate to our circumstances. If the foreign exchange constraint binds, then $\delta\gamma/\delta f = \alpha/m_k$. This is larger than in the case that the savings constraint binds, under the plausible assumptions that the savings propensity is small and that only a minority of capital goods are imported. Then foreign aid has a larger growth effect in a foreign-exchange-constrained economy than in one that is savings constrained because only a fraction less than one of foreign aid is saved, while all of f can be used to finance additional imports.

Finally, eq. (8) can be solved in similar fashion:

$$\gamma = (\alpha/g_k)[-g_c + t_y(1-c) + t_f f] \quad (11)$$

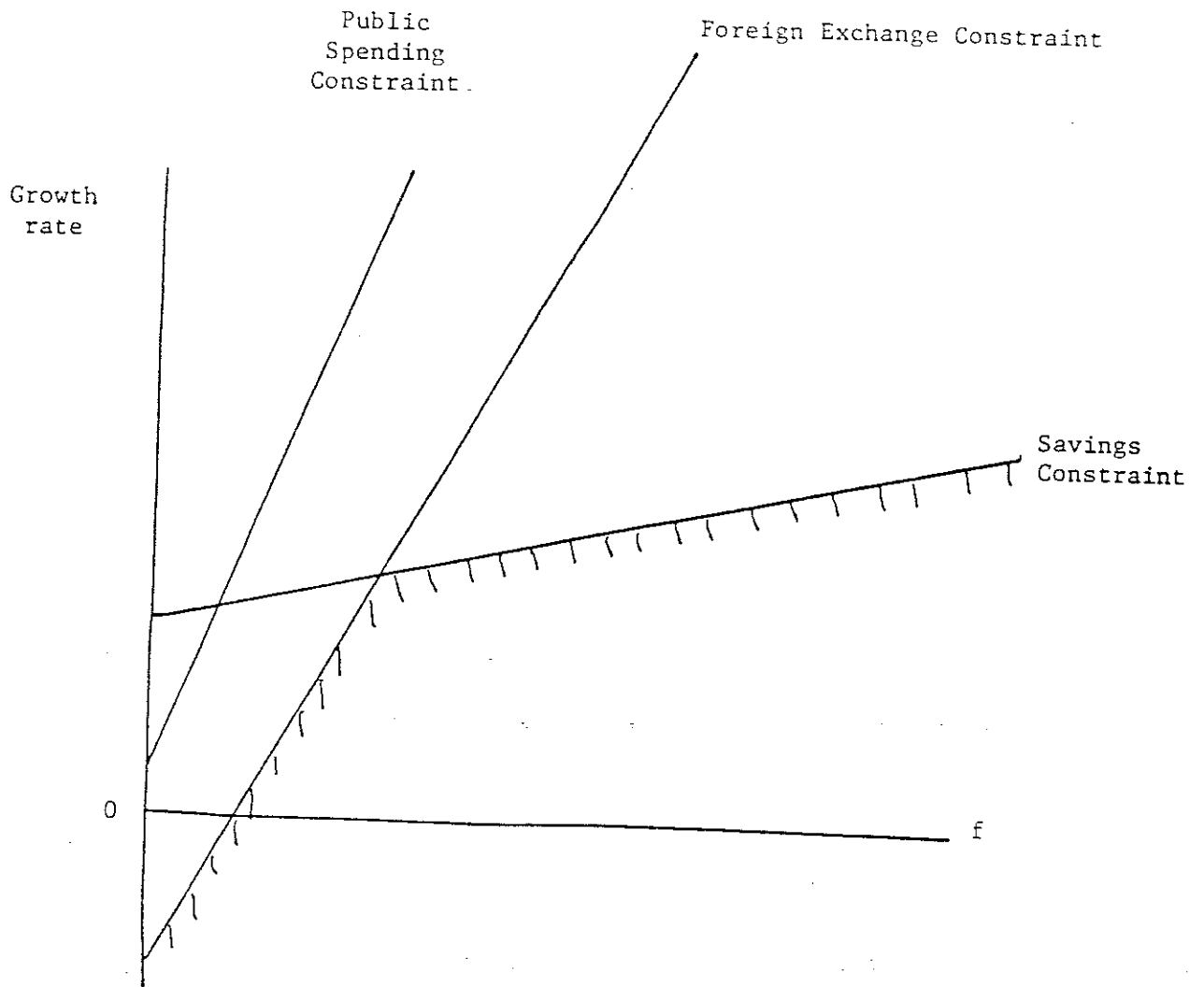
This is the relationship between aid and growth in an economy constrained by public capital formation. The likelihood that this constraint will bind

depends both on the intercept (and hence on proximity to subsistence c) and on the slope of $\delta y/\delta f$ (namely $\alpha t_f/g_k$). The growth effect of foreign aid may be larger or smaller than in savings- and foreign-exchange-constrained economies. If $t_f > s$, which is plausible for the Marshall Plan period, and if m_k and g_k are small, then the effect of foreign aid in a public-spending-constrained economy will be larger than that in a savings-constrained economy. There is no obvious presumption about the relative size of the effect in foreign-exchange and public-spending constrained economies, which depends mainly on the relative magnitude of g_k and m_k .

Figure A1 shows the case where g_k is large relative to m_k , for a poor economy (one just above subsistence in the absence of foreign aid). The foreign exchange constraint cuts the public spending constraint from below. Additional foreign aid produces progressively smaller increments to growth, depending on whether the foreign exchange, public spending or savings constraints bind. Figure A2 shows the case where g_k is small relative to m_k . Here public spending is never a binding constraint.

How does the level of income influence the growth effects of foreign aid? As c declines from unity (the economy moves away from the margin of subsistence), the savings and public-capital-formation constraints shift up. For a given range of foreign aid, it becomes more likely that the foreign exchange gap binds, implying a large growth effect. Thus, the effects of the Marshall Plan should have depended in part on which of these three constraints were binding, which should have depended in turn on the initial level of income.

Figure A2



Appendix B

Regression Analysis of Investment, Current Balance and Public Spending

In this appendix we present a regression analysis of the links between the Marshall Plan and investment, current account balance and public spending.

Data for the immediate post-World War II period have serious limitations. Statistical agencies were in disarray in 1945-46, but some scattered data are available even for this early period. Estimates of economic aggregates consistent with those for subsequent years and compatible across countries become available only around 1948, however, when statistics were first gathered and processed into consistent form by the OEEC. Most data used in this analysis are drawn from the OEEC's "Statistics of National Product and Expenditure" and cover the period 1948-55.

The major exceptions are the rate of growth of GDP and Marshall Plan allotments.²⁹ Marshall Plan allotments were drawn from Mutual Security Program (various issues). We include funds made available in 1951-55 under the provisions of the Mutual Defense Assistance Program.³⁰ Data on the growth of GDP are from Maddison (1982), who drew figures from national sources and adjusted them for consistency. Maddison's sample therefore defines the 16 industrial countries forming our international cross section: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, the UK and the US.³¹

Investment, the current account and government spending are all assumed to depend on the economy's underlying rate of growth, proxied by per capita GDP relative to the US and by GDP growth since 1938. In addition, they are determined by the rate of population growth, the rate of consumer price

inflation and the openness of the economy. Marshall Plan allotments are entered with a one year lag to minimize simultaneity.³²

The first column of Table B1 reports the results on the determinants of investment. Investment ratios were higher in countries with rapidly growing populations, which had already restored output to 1938 levels, and which were far from the technological frontier as defined by the United States. There is no indication that monetary stabilization, openness or the terms of trade (export prices relative to import prices) had a strong impact on investment.³³

In contrast, Marshall Plan transfers equal to 2% of GNP raised investment by 0.7 per cent of GNP in the subsequent year. This suggests a significant impact of the Marshall Plan.

The second column reports results for the current account balance. Relatively poor countries (those with per capita incomes far below America's) and countries that succeeded in restoring output to 1938 levels tended to run current account deficits. Openness is associated with current account surpluses. High inflation countries ran current account deficits, which is plausible insofar as inflation signals excess demand.

There is evidence, moreover, that Marshall Plan inflows permitted the maintenance of larger current account deficits. Transfers equal to 2% of GNP were associated with an additional current account deficit equal to 1/4% of national income in the subsequent year.

The third column reports results for government spending. This is the least robust of the three equations. Marshall Plan receipts enter with a negative coefficient, suggesting declines in the public spending share in countries receiving US aid. This may be plausible insofar as the US pressured

Table B1

Channels Linking the Marshall Plan to Growth, 1948-54
 (Dependent variables expressed as shares of GDP)

	<u>Investment</u>	<u>Current Acct.</u>	<u>Gov. Spending</u>
Constant	0.21 (5.42)	-0.16 (3.16)	0.37 (2.84)
GDP Relative to US	-0.10 (2.42)	0.17 (3.20)	-0.28 (2.11)
GDP growth since 1938	0.10 (6.79)	-0.05 (2.41)	0.01 (0.29)
Terms of Trade	-0.01 (1.98)	0.01 (0.37)	0.01 (0.34)
Pop Growth	1.08 (2.42)	-0.24 (0.39)	1.95 (1.25)
CPI Inflation	0.06 (2.73)	-0.55 (1.63)	-0.13 (1.75)
Openness	-0.03 (0.64)	0.48 (7.35)	-0.01 (0.03)
Marshall Plan Lagged	0.36 (2.53)	-0.12 (2.28)	-0.31 (0.63)
n	122	113	125
S.E.	0.02	0.02	0.06

Note: t-statistics in parentheses. Country dummy variables are included in all equations.

Source: see text.

recipients to reduce government spending and to the extent that some countries, notably Britain, used counterpart funds to retire public debt, reducing debt service charges. In any case, the evidence on government spending provides little support for the notion that the Marshall Plan operated by bridging the fiscal gap.

Appendix C

Regression Analysis of Growth

In this appendix we present a regression analysis of the determinants of GDP growth.

Table C1 reports the simplest possible convergence and catchup regressions that might be used to analyze the Marshall Plan. We think of these as descriptive correlations rather than tests of a particular model like that estimated below. The growth rate for each year from 1948 through 1954 is regressed on per capita GDP relative to the US, the GDP growth rate since 1938, and Marshall Plan allotments as a share of GNP in the current and immediately preceding years. Faster growth is exhibited by countries farther from the technological frontier as defined by the United States, and by countries whose output had fallen most from prewar levels.³⁴ Marshall Plan effects are substantial. The coefficients on both the current and preceding year's Marshall Plan allotments differ from zero at the 95% level; the negative lagged term is about half the size of the positive contemporaneous one. (Subsequent lags never approached statistical significance.) A coefficient of unity suggests that a transfer of 2% of GDP raised the growth rate of domestic output by two percentage points in the same year.

A reason to hesitate before drawing such inferences is the possible endogeneity of Marshall Plan allotments. To test for this possibility, we used a procedure suggested by Hausman (1978). We added to the third equation in Table C1 the fitted values of Marshall aid (current and lagged one year) derived from regressing it on the current balance and per capita GDP.³⁵ While the lagged value of Marshall aid had a small t-statistic, that on the

Table C1

Catch-up and Convergence Regressions
 (Dependent variable is growth rate of real GDP)

	(1)	(2)	(3)
Constant	0.08 (9.04)	0.06 (7.94)	0.07 (9.02)
GDP relative to US	-0.06 (3.38)		-0.09 (3.91)
GDP growth since 1938		-0.01 (0.74)	-0.03 (2.04)
Marshall Plan	1.29 (4.55)	1.43 (4.73)	1.41 (4.92)
Marshall Plan Lagged	-0.67 (2.44)	-0.59 (2.08)	-0.67 (2.46)
n	126	126	126
S.E.	0.04	0.04	0.04

Note: t-statistics in parentheses.

Source: see text.

current value was significantly greater than zero at the 95% confidence level, supporting our suspicion of the endogeneity of Marshall Plan allotments.

Table C2 therefore lags Marshall Plan aid one and two years to redress problems of simultaneity.³⁶ In addition, it augments the basic regression with measures of economic structure and policy, a la Barro (1989) and Romer (1989). GDP per capita relative to the US continues to enter with a negative sign, as if countries far from the technological threshold had the greatest scope for growth subsequently, but GDP growth since 1938 no longer exhibits a negative sign. Openness, measured as exports as a share of GNP, enters negatively, indicating slower growth in more open economies (which plausibly suffered most from bilateral clearing arrangements, nontariff barriers and the slow recovery of trade). As in previous studies like Michaely (1977), the growth rate of exports (in constant prices) enters positively.

The coefficients on Marshall Plan allotments lagged one and two years both differ from zero at the 95% confidence level. Those on Marshall aid lagged one year are between 1/2 and 1, suggesting that allotments equal to 2% of European GNP raised European output by 1 to 2 percentage points in the subsequent year. Now, however, the coefficient on the second lag is as large in absolute value as the coefficient on the first. (We cannot reject the hypothesis that the two coefficients are equal if opposite in sign at the 95 per cent confidence level.) This suggests that the effect of the Marshall Plan was temporary. The last three columns add investment, the current account surplus and central government expenditure as shares of GNP. None appears to have had a statistically significant impact on growth.

A possible explanation for the small and statistically insignificant coefficients on investment, the current account and government spending is

Table C2

Additional Growth Regressions for 1948-52
(Dependent variable is growth rate of real GDP)

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.08 (8.81)	0.09 (7.85)	0.10 (1.99)	0.08 (5.02)	0.09 (4.89)	0.07 (1.00)
GDP relative to US	-0.09 (5.24)	-0.10 (5.25)	-0.09 (1.44)	-0.09 (4.72)	-0.10 (3.61)	-0.05 (0.66)
GDP growth since 1938	0.05 (4.61)	0.05 (4.13)	0.04 (1.79)	0.04 (3.76)	0.05 (3.61)	0.02 (0.67)
Openness	-0.10 (3.98)	-0.10 (3.99)	-0.15 (1.78)	-0.10 (3.26)	-0.11 (3.30)	-0.09 (0.86)
Export Growth	0.05 (4.72)	0.04 (2.99)	0.04 (3.66)	0.05 (4.27)	0.04 (2.76)	0.04 (3.18)
Marshall Plan Lagged	0.59 (2.85)	0.85 (3.10)	0.38 (1.47)	0.58 (2.52)	0.73 (2.48)	0.38 (1.39)
Marshall Plan Lagged twice	-0.41 (1.95)	-0.83 (3.09)	-0.45 (1.88)	-0.49 (2.18)	-0.78 (2.69)	-0.58 (2.29)
Investment				0.01 (0.20)	0.01 (0.16)	-0.01 (0.28)
Current Acct				-0.05 (0.47)	-0.03 (0.30)	-0.06 (0.44)
Government Spending				0.01 (0.06)	0.01 (0.35)	0.02 (0.29)
Year dummies		x			x	
Country dummies			x			x
n	112	112	112	112	112	112
S.E.	0.03	0.03	0.03	0.03	0.03	0.03

Note: t-statistics in parentheses.

Source: See text.

simultaneity bias. We tested for the endogeneity of these variables using the Hausman test described above, adding the fitted values for investment, the current account and government from the equations reported in Table B1 to the growth equations just reported, together and separately. In no case did the fitted values have t-statistics as large as one, supporting our treatment of these variables as exogenous with respect to growth.

Our three-gap model suggests that aid transfers to countries with low levels of investment, large current account deficits and limited capacities to finance additional government spending may have had a disproportionately large impact on growth. To test this hypothesis, Marshall Plan allotments as a share of GNP lagged one year were interacted with the investment, current account and government spending ratios. (We also interacted Marshall Plan allotments lagged 2 years with the investment, current account and government spending variables, but the second lags were not statistically significant.) The estimated equations are reported in Table C3. The coefficient on Marshall aid lagged one year is now significantly greater than zero at the 99% confidence level. That on Marshall aid lagged twice differs significantly from zero at the 95% level in one of the three cases; in all three equations it is significantly smaller (at the 95 per cent level) than the coefficient on the first lag.

The interaction terms often display coefficients significantly different from zero at the 95% level. Their negative coefficients accord with the intuition provided by the three-gap model. That on the Marshall Plan interacted with investment suggests that American aid provided the least stimulus to growth in countries where investment was already high. That on the Marshall Plan interacted with the current account ratio suggests that it

Table C3

Growth Equations with Interactive Marshall Plan Effects, 1948-54
 (Dependent variable is growth rate of real GDP)

	(1)	(2)	(3)
Constant	0.06 (3.29)	0.06 (3.24)	0.07 (1.15)
GDP relative to US	-0.08 (4.28)	-0.09 (4.45)	-0.09 (1.43)
GDP growth since 1938	0.04 (3.32)	0.04 (3.35)	0.01 (0.48)
Openness	-0.10 (3.25)	-0.10 (3.33)	-0.23 (2.30)
Export Growth	0.04 (3.98)	0.03 (2.51)	0.03 (2.67)
Marshall Plan Lagged	2.86 (2.43)	2.96 (2.39)	5.36 (4.12)
Marshall Plan Lagged Twice	-0.26 (1.18)	-0.54 (1.91)	-0.23 (0.92)
Investment	0.10 (1.40)	0.11 (1.48)	0.35 (1.96)
Current Acct.	0.09 (0.89)	0.12 (1.11)	0.25 (1.74)
Gov. Spending	0.02 (0.49)	0.03 (0.74)	0.04 (0.75)
Investment * Marshall Plan	-6.91 (2.10)	-7.29 (2.21)	-9.16 (2.64)
Current Acct * Marshall Plan	-14.35 (2.61)	-14.69 (2.67)	-15.12 (2.78)
Gov. Spending * Marshall Plan	-5.83 (1.48)	-5.29 (1.27)	-16.50 (3.49)
Year dummies		x	
Country dummies			x
n	112	112	112
S.E.	0.03	0.03	0.03

Note: t-statistics in parentheses.

Source: see text.

boosted growth least in countries whose current account position was strong. That on the Marshall Plan interacted with government spending suggests that American aid stimulated growth least in countries where government spending was already high. This supports the notion that the Marshall Plan had the largest impact on growth in countries for which the savings, current account and fiscal gaps were binding.

To test whether the use of counterpart funds had a significant impact on growth, we added to the model counterpart withdrawals for productive purposes (investment and purchases of intermediates). Since counterpart authorizations followed Marshall Plan allotments with a lag of several quarters, we used the current year's authorizations rather than authorizations lagged. To make the effect of counterpart funds as transparent as possible, we defined the variable as counterpart withdrawals for production minus Marshall Plan allotments lagged.

Table C4 reports the results. Both Marshall Plan allotments and counterpart withdrawals have economically important and statistically significant effects. But with the addition of measures of the use of counterpart funds, the interaction terms introduced in Table C3 matter less than before. Their coefficients are uniformly smaller than in Table C3, and only the interaction terms involving the investment and government spending ratios in the equation with country dummy variables differ significantly from zero at standard confidence levels. Given the insignificance of the majority of these terms, we excluded the interactions from the equations reported in the middle three columns of Table C4. The coefficients on Marshall Plan allotments remain statistically significant. The same is true of the first lag of counterpart withdrawals. Evidence on the second lag on counterpart

Table C4
Growth Equations Distinguishing Counterpart Funds Used for Production

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.06 (3.28)	0.06 (3.27)	0.05 (0.91)	0.08 (4.65)	0.08 (4.61)	0.05 (0.72)	0.05 (0.84)	0.06 (1.06)	0.04 (0.61)
GDP Relative to US	-0.08 (4.09)	-0.09 (4.18)	-0.08 (1.25)	-0.08 (4.43)	-0.09 (4.52)	-0.04 (0.59)	-0.08 (1.27)	-0.09 (1.44)	-0.04 (0.06)
GDP Growth Since 1938	0.04 (3.18)	0.04 (3.10)	0.01 (0.24)	0.04 (3.42)	0.04 (3.29)	0.06 (0.22)	0.01 (0.13)	0.01 (0.13)	0.01 (0.08)
Openness	-0.09 (2.81)	-0.09 (2.82)	-0.21 (2.05)	-0.09 (2.78)	-0.09 (2.74)	-0.09 (0.91)	-0.21 (2.08)	-0.24 (2.39)	-0.10 (0.94)
Export Growth	0.05 (4.08)	0.03 (2.51)	0.03 (2.83)	0.05 (4.30)	0.03 (2.62)	0.04 (3.29)	0.03 (2.89)	0.03 (2.74)	0.04 (3.31)
Marshall Plan Lagged	3.74 (2.93)	3.62 (2.71)	5.75 (4.02)	2.30 (4.10)	2.40 (4.03)	1.53 (2.29)	5.58 (3.93)	5.05 (3.91)	1.65 (2.49)
Marshall Plan Lagged Twice	-1.05 (1.74)	-0.97 (1.45)	-1.48 (2.30)	-1.62 (3.29)	-1.74 (3.30)	-2.26 (4.08)	-1.43 (2.23)	-0.32 (1.29)	-2.26 (4.13)
Investment	0.09 (1.31)	0.09 (1.31)	0.39 (2.21)	0.04 (0.66)	0.04 (0.59)	0.19 (1.06)	0.42 (2.42)	0.40 (2.25)	0.24 (1.36)
Investment for Norway	-	-	-	-	-	-	-1.35 (1.54)	-1.60 (1.85)	-1.57 (1.70)
Current Acct.	0.08 (0.72)	0.10 (0.93)	0.22 (1.54)	0.02 (0.18)	0.02 (0.22)	0.04 (0.31)	0.22 (1.56)	0.25 (1.76)	0.04 (0.26)
Gov. Spending	0.02 (0.49)	0.03 (0.73)	0.04 (0.76)	0.01 (0.18)	0.01 (0.40)	0.02 (0.39)	0.04 (0.85)	0.04 (0.87)	0.03 (0.50)
Investment* Marshall Plan	-5.57 (1.62)	-5.77 (1.65)	-8.64 (2.39)	-	-	-	-7.96 (2.20)	-8.61 (2.51)	-8.64 (2.39)
Current Acct.* Marshall Plan	-8.24 (1.25)	10.55 (1.55)	-8.31 (1.29)	-	-	-	-9.67 (1.50)	-16.16 (2.99)	-
Government Spending* Marshall Plan	-5.22 (1.29)	-5.24 (1.22)	-14.72 (3.07)	-	-	-	-14.53 (3.05)	-15.78 (3.38)	-
Counterpart for Prod. - M.P.	1.37 (1.74)	1.08 (1.29)	0.90 (1.07)	2.16 (3.34)	2.13 (3.19)	1.57 (2.12)	0.97 (1.15)	-	1.70 (2.30)
Counterpart for Prod. - M.P. Lagged	-0.62 (1.01)	-0.20 (0.30)	-1.35 (2.08)	-0.99 (1.81)	-0.77 (1.29)	-1.87 (3.00)	-1.15 (1.74)	-	-1.69 (2.71)
Year Dummies	-	x	-	-	x	-	-	-	-
Country Dummies	-	-	x	-	-	x	x	x	x
n	112	112	112	112	112	112	112	112	112
S.E.	0.03	0.03	0.02	0.03	0.03	0.03	0.02	0.02	0.03

Notes: t-statistics in parentheses.
Source: see text.

withdrawals is mixed. The results in the fourth column suggest that a Marshall Plan inflow of 2% of GNP raised output in the next year by 4.6 per cent when a matching amount of counterpart funds were withdrawn for productive purposes. When counterpart funds were used for other purposes, however, the impact on output growth was only 0.3%. About two-thirds of the first year's output growth was given back in the second year.

The fifth equation, which includes dummy variables for years, is essentially identical. Once again, however, the equation including dummy variables for countries (in the sixth column) tells a different story. A Marshall Plan allotment raises the growth rate in the first year after which it is received but reduces growth by a matching amount in the second subsequent year. This is true regardless of the disposition of counterpart funds.³⁷

Thus, these results support the view that the Marshall Plan had important economic effects. The conditionality attached to ERP transfers, in the form of the allocation of counterpart funds, played an important role in shaping the effects of American aid.

To determine the robustness of the results, we undertook a number of sensitivity analyses. We first reestimated the model containing counterpart effects but omitting interaction terms (the fourth equation of Table C4) eliminating each observation in turn. In no case did the omission of a single observation produce a noticeable change. Next we explored whether the results were driven by the observations for a particular country. In no case did the omission of a single country have much impact on the coefficients on Marshall Plan allotments and counterpart withdrawals. (That the results survive

Germany's exclusion reassures us that they are not picking up the effects of American occupation or of currency reform.)

A potentially troubling aspect of these equations is the small size and statistical insignificance of the investment ratio. Our scatter plot of investment and growth suggests that the absence of a relationship may be due to the exceptionally high ICOR of Norway. We therefore added to our growth equations the product of the investment ratio and the dummy variable for Norway -- which allowed the ICOR for this country to differ. The relevant regressions are shown in the last three columns of Table C4. This greatly increased the magnitude of the investment coefficient for the remaining countries. When the interaction term for Norway was included along with the vector of country dummy variables, the investment rate was generally statistically significant at the 95% confidence level. The coefficient on the investment rate, now in the neighborhood of 0.4, is similar to those obtained in other recent studies.

Of the other coefficients, the principal change is in the magnitude of the current account ratio. This now has a larger effect and in one case is statistically significant at the 90% level. The other coefficients remain essentially unchanged. In particular, the effects of the Marshall Plan and counterpart withdrawals are no different than before.

Appendix D

Foreign Aid in Models of Economic Growth

In this appendix we analyze in more detail the dynamic effects of a temporary foreign aid program in alternative models of economic growth.

The Ramsey-Solow Model

We first analyze the response to a one-time transfer of aid in a model featuring constant returns to scale in production. The basic model (and notation) follow Blanchard and Fischer (1989), where further details may be found.

Output is produced using capital and labor. The labor force N grows at a constant exogenous rate n . There is no depreciation of capital K or productivity growth. Output is either consumed or invested.

$$Y_t = F(K_t, N_t) = C_t + \frac{dK_t}{dt}. \quad (1)$$

The production function is homogeneous of degree one and the usual regularity conditions apply. In per capita terms:

$$f(k_t) = c_t + \frac{dk_t}{dt} + nk_t, \quad (2)$$

Household utility is represented as:

$$U_s = \int_s^{\infty} u(c_t) \exp[-\theta(t-s)] dt. \quad (3)$$

where θ is the (strictly positive) rate of time preference. The household maximizes this expression subject to its budget constraint:

$$c_t + \frac{da_t}{dt} + na_t = w_t + r_t a_t, \quad (4)$$

for all t , k_0 given, where

$$a_t \equiv k_t - b_{pt}. \quad (5)$$

Nonhuman wealth a equals per capital holdings of capital k minus per capita household debt. We assume that the economy is closed to world financial markets (foreign borrowing is not possible). Perfect foresight is assumed throughout. We impose the intertemporal budget constraint on our infinitely-lived households.

Assume many identical firms that rent capital and labor services at rates r and w that are taken exogenous to individual households. Maximizing (3) with respect to c yields the following necessary and sufficient conditions.

$$\frac{du'(c_t)/dt}{u'(c_t)} = \theta + n - r_t, \quad (6)$$

$$\lim_{t \rightarrow \infty} a_t u'(c_t) \exp(-\theta t) = 0. \quad (7)$$

$$c_t + \frac{dk_t}{dt} + nk_t = f(k_t), \quad (8)$$

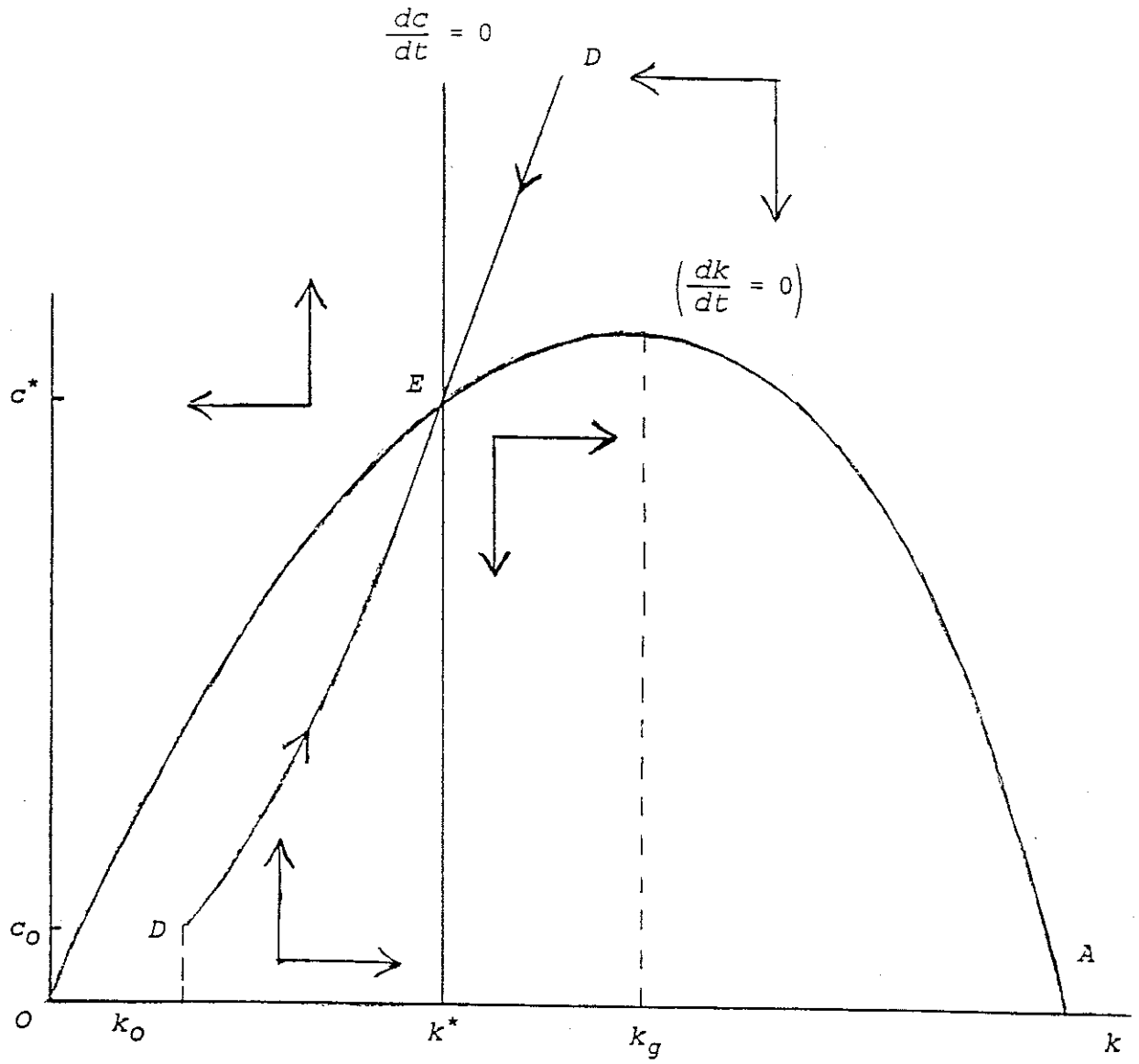
$$\frac{du'(c_t)/dt}{u'(c_t)} = \theta + n - f'(k_t). \quad (9)$$

The basic phase diagram appears as Figure D1. The $dk/dt=0$ locus reaches a maximum at the golden rule capital stock, after which it declines to the horizontal axis. The $dc/dt=0$ locus is vertical at the modified golden rule capital stock, which is lower than the golden rule capital stock (which maximizes per capita consumption) because of positive time preference.

The intersection of the two loci defines the economy's steady state, and the arrows around it govern its dynamics. There is a unique saddle path converging to that steady state. We assume that the convergent path is followed.

To analyze the dynamic response to foreign aid, it is helpful to first consider the effects of a permanent program. Assume that the economy starts out of the steady state, with a capital stock $k(g)$ below the modified golden

Figure D.1

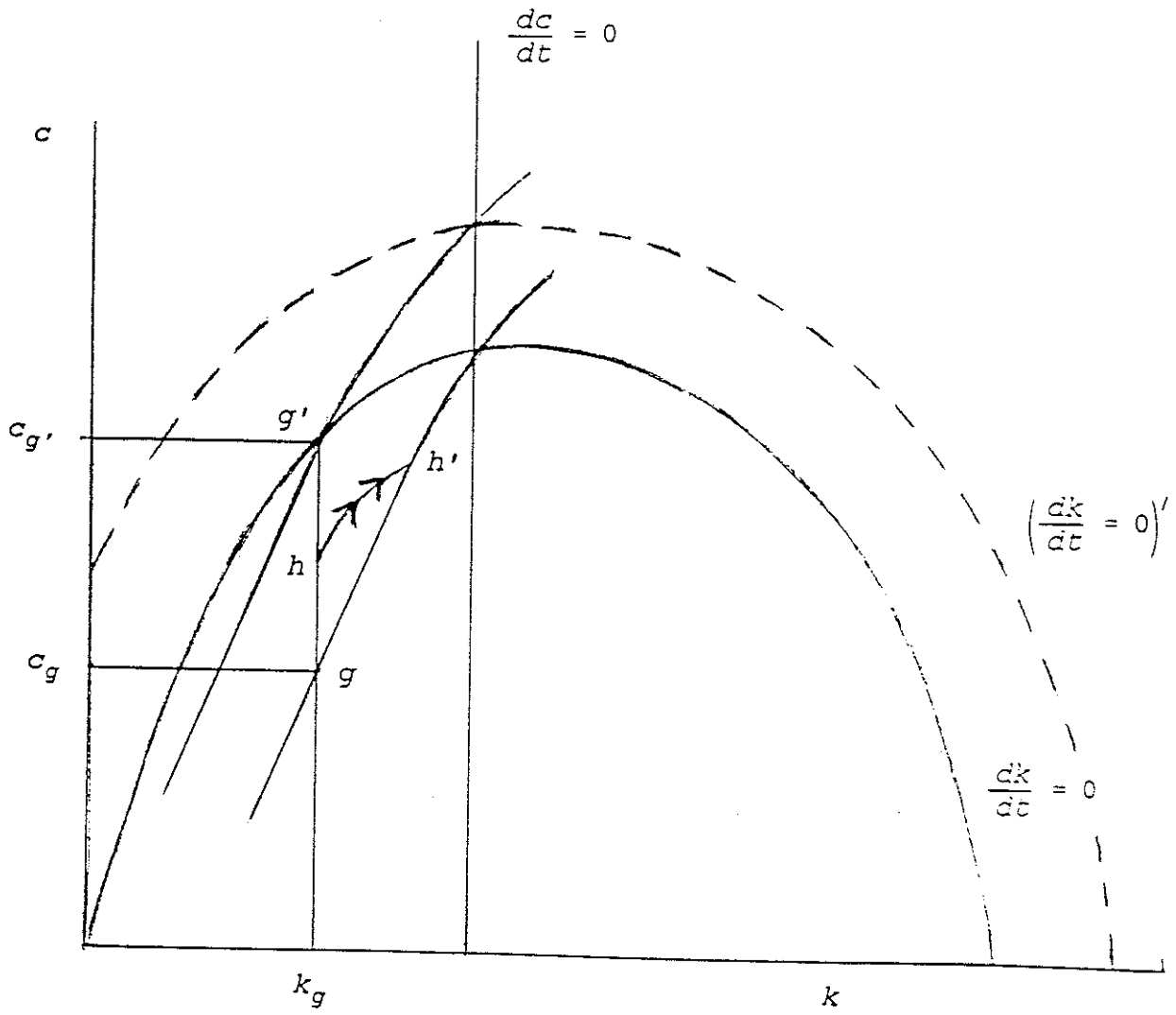


rule level. By increasing household wealth, the permanent transfer shifts the dk/dt locus upward, as in Figure D2. Since technology is unchanged, so is the modified golden rule capital stock. In the long run, therefore, the transfer goes entirely to consumption. On impact, consumption jumps from $c(g)$ on the old saddle path to $c(g')$ on the new one. Neglecting second-order effects (associated with curvature of the saddle path), there is no impact on the subsequent rate of growth.

Consider now an unanticipated foreign aid program known to be temporary once it is adopted. Perfect foresight requires no jumps in consumption when the program terminates; hence the economy must be on the old saddle path at that time. Until then, however, dynamics are governed by the new (aid-inclusive) laws of motion. Hence, with foreign aid consumption jumps up to h . Since this point is below the $dk/dt=0$ locus and to the left of the $dc/dt=0$ locus, both consumption and the capital stock rise over time. The distance between g and h must be just sufficient that the laws of motion bring the economy to the old saddle path at h' when the aid program terminates. Note that since consumption cannot change discontinuously at the moment the aid program terminates, investment falls at that instant by the amount of the aid withdrawn.

How does output grow overtime? From h to h' , consumption is growing more slowly than along the saddle path, so the capital stock (and output) must be growing faster. The temporary aid package thus leads initially to an acceleration of growth. Since the capital stock grows faster than along the saddle path, h' is reached earlier than it would be otherwise. Since the rate of growth of capital (and output) declines with the gap between the current capital stock and its steady state value, there is a subsequent period

Figure D.2



when output then grows more slowly than it would had the aid package not been provided. These alternative paths are sketched out in Figure D3.

The Arrow-Romer Model

In the Ramsey-Solow model, the assumption of constant returns dictates that the steady-state level of output is invariant with respect to the transfer. Faster growth in the short run must be offset by slower growth subsequently until the unique steady state level of output is restored. As an alternative, we now consider an endogenous growth model in which the level of output and rate of growth can be permanently affected by the transfer. Our exposition follows Cohen (1991).

The critical assumption involves modifying the production function such that:

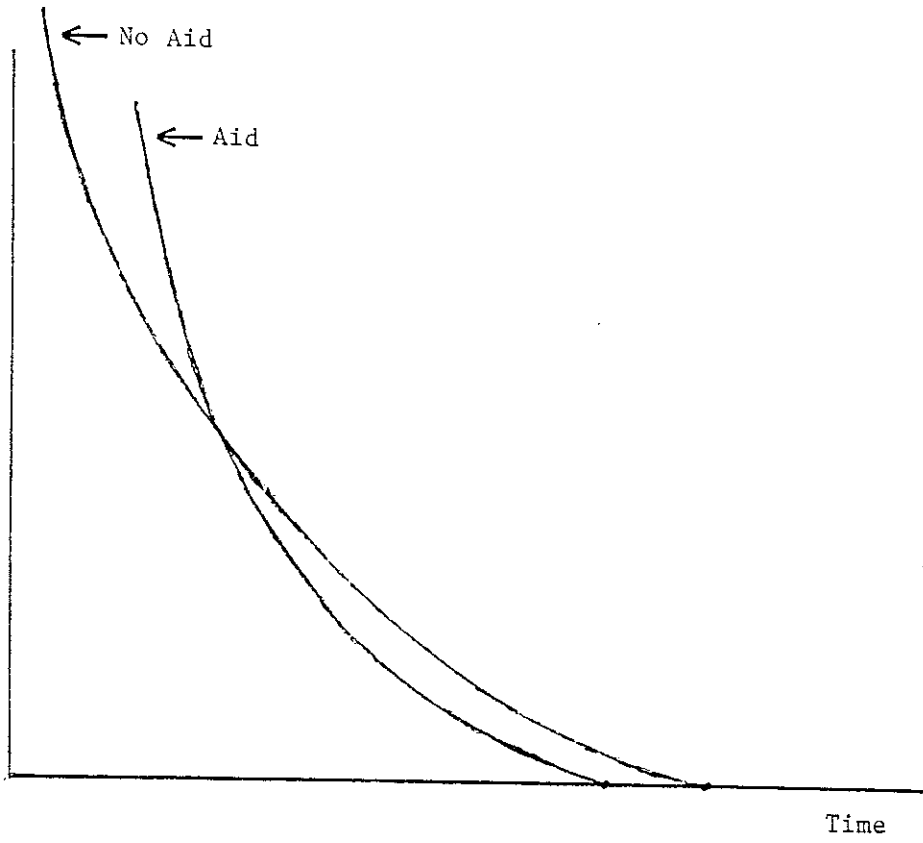
$$Q_t = aK_t \tag{10}$$

No longer are there diminishing returns to capital. (Otherwise, previous assumptions apply.) Since labor is no longer an argument of the production function, we assume without loss of generality that labor supply is fixed. For simplicity, we specialize the utility function to

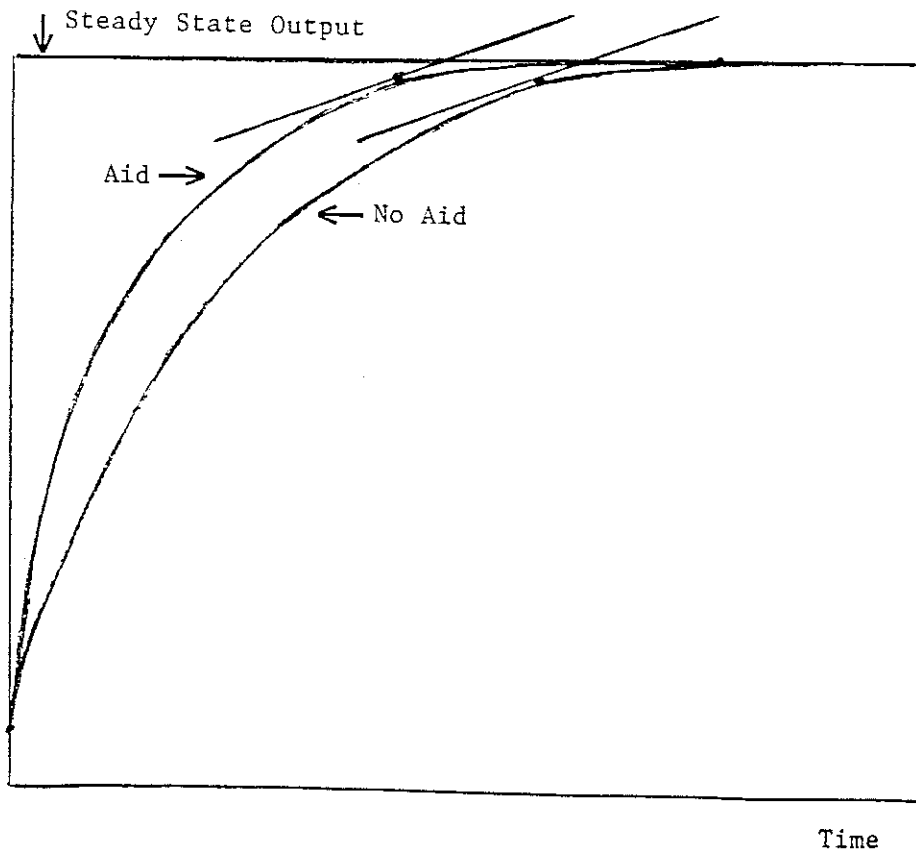
$$\frac{C_t^\gamma}{\gamma}$$

Figure D.3

Rate of
Per Capita
Growth of
Output



Level of
Per Capita
Output



One can verify that the growth rate is characterized by a constant investment rate $I(t)/Q(t) = x(0)$ and a constant growth rate $n(0)$ which are the solutions to:

$$\begin{aligned} n_0 &= a x_0 \\ x_0 &= \text{Arg max}_x \frac{1}{\gamma} \frac{[1-x]^\gamma}{\delta - \gamma(a x)} \end{aligned} \tag{11}$$

Assume now that the country receives a permanent foreign aid transfer b^* proportional to its GDP. Agents' response is to choose investment and growth as the solution to:

$$\begin{cases} n_0 = a x_b^* \\ x_b^* = \text{Arg max}_x \frac{1}{\gamma} \frac{[1+b^*-x]^\gamma}{[\delta - \gamma a x]} \end{cases} \tag{12}$$

It is optimal to invest part of the transfer and consume the rest. In contrast to the previous model, where a permanent transfer had no impact on growth, in this model it leads to a higher investment share of GDP and to a faster growth rate permanently.

Consider next a temporary aid transfer. In the long run, $b^*=0$; growth is still governed by eq. 11. As in the Ramsey-Solow model, there will be no long-run impact on the rate of growth. But in the short run, so long as $b^*>0$, some portion of the transfer will be devoted to investment; the growth rate jumps up temporarily. The assumption that the end of the aid program is

anticipated means as before that the level of consumption cannot change discontinuously at the moment of aid's termination. Again, the level of investment must fall by exactly the amount of the withdrawn aid, back to its pre-transfer level. The implication is that growth first accelerates and then returns to its previous rate (without, as in the Ramsey-Solow model, requiring an interlude of slower growth). In contrast to the previous model, the level of output (but not its rate of growth) rises permanently due to the temporary aid program.

Box 1.

The Origins of The Marshall Plan

George C. Marshall traced the origins of the plan that bears his name to the failure of Britain and America in the spring of 1947 to win Soviet support for German industrial reconstruction. The Truman Administration was convinced that American prosperity required buoyant export markets, which hinged in turn on European recovery. The 1947 crisis convinced Marshall and other US officials that a viable European economy required a prosperous Germany at its core. Holding down German industrial production limited German imports from the rest of Europe and hindered the continent's recovery. Reversing the policy of limiting German production was necessary to stimulate European growth.

Secretary of State Marshall and British Foreign Secretary Ernest Bevin put these points to the Soviets at the Moscow Foreign Ministers Conference of March-April 1947. Soviet resistance was interpreted as a ploy to radicalize Western European politics by destabilizing the continent's economy. This in turn provided the impetus for Marshall's aid proposal.

His June 5th Harvard address offered to include "everything up to the Urals" so as not to antagonize European governments wishing to avoid a confrontation with the Soviet Union. It seems unlikely that the US was serious about including the Soviet Union. Washington made clear that its offer was contingent on close cooperation by the participating governments among themselves and with the United States, cooperation which extended to the disclosure of detailed information about the operation of their economies. American aid also entailed a commitment on the part of the recipients to economic integration and a willingness to accept American input into the

formulation of domestic policy. Once these conditions were spelled out, the Soviets rejected them to no one's surprise.

The Economic Cooperation Act was passed in April 1948 as part of the Foreign Assistance Act, which included also aid to China, assistance to Greece and Turkey, and funds for UNICEF. In the meantime, an Interim Aid Program was launched in December of 1947 to provide modest assistance for Austria, France and Italy. The European Recovery Program opened with a 90 Days Recovery Program spanning the second quarter of 1948, followed by the first full ERP year (July 1948-June 1949).

Box 2.

The Peculiar Case of Norwegian Investment

In Figure 2, Norway's high ICOR stands out. This led us to estimate a separate elasticity of output with respect to investment for Norway, which suggested that the marginal effect of investment on output might actually have been negative. This finding warrants further discussion.

Norway's capital stock had been devastated by the war. Nearly half the merchant marine fleet had been sunk. In retreating before the Russian Army, Germany adopted a scorched-earth policy and devastated Norway's northern regions. In response, the country embarked on an ambitious investment program, with the government using every device to stimulate capital formation. Rations of food and consumer goods were kept at exceptionally low levels. The average urban dweller received less than 1 pound of meat a month, fewer than 30 eggs a year, and half a pint of milk a day. Cabinet ministers bicycled to work to encourage citizens to economize on their spending.

Norway's policy of investment promotion stayed in place throughout the 1950s. Large shares of national income were devoted to investment in rebuilding the merchant marine, in hydroelectric power, and in industries producing for export. The principal exports were forest products, fish products, and ore, metals and iron and steel products. Metals and engineering accounted for more than a third of Norwegian gross investment in industry in 1947 (UN, 1949b, p.52). Investments in rebuilding the merchant marine were particularly important. The transportation sector accounted for 40% of Norwegian investment in 1947 and 1948, a larger fraction than for any of the other 11 countries for which United Nations (1949a, p.50) provided sectoral breakdowns.

The United Nations (1964) devoted an entire subsection of its report on European economic growth in the 1950s to the low productivity of investment in Norway. Norway's ICOR was shown to be higher than for any other European country but Ireland. UN (1964, chapter IV, pp.17-22) cited a combination of factors to account for this disappointing performance. Capacity utilization in Norwegian industry declined between 1948 and 1959, which reduced measured productivity. The country was said to have invested in the wrong industries, like herring oil and meal. Investment in the engineering industry significantly exceeded the availability of labor with the relevant skills. Agricultural machinery was underutilized. Investments in transport and hydroelectric power yielded significant increases in output only after an exceptionally long gestation period, and government's efforts to bias investment toward the northern regions of the country exacerbated these tendencies. Thus, there seems justification for our econometric result.

Box 3.

The Mechanics of the Marshall Plan

The bill passed by Congress authorized US assistance to Europe for four years but insisted that appropriations take place annually. The package authorized \$5.3 billion for the first year, which approximated the Administration's request of \$6.8 billion for 15 months. Congress specified that assistance could take the form of either grants or loans, but placed a ceiling on the loan component of the program (\$1 billion in the first year).

Subject to these limitations, the ECA administrator, heading up an independent agency, was authorized to procure commodities and services from all sources for countries in need and to defray the cost of their transportation. The administrator was instructed to curtail the procurement of American goods in short supply and to encourage the use of surplus stocks. In the case of surplus agricultural commodities, procurement was restricted to the US.

When requesting the shipment of foreign merchandise, governments or nationals of the participating countries submitted procurement authorization requests to the ECA. Applications were reviewed to determine whether or not they exceeded the country's allotment, whether they satisfied the criteria set down by the Act, and for their effect on the US economy. Upon approval the ECA issued a letter of commitment to a cooperating bank guaranteeing ECA reimbursement of the credit extended. After the recipient of the merchandise, usually a government agency, deposited a matching amount of local currency to a so-called counterpart account, they were able to draw on the credit established in the United States.

The US State Department set the interim allocations for the first two ERP quarters (April-September 1948) but insisted that participating governments do so subsequently. For 1948 two US government studies had estimated the dollar deficits of European countries at \$5.3 billion. The participating countries, when polled, objected that this figure understated their prospective deficits. In the event, it soon became apparent that Congress would appropriate only \$4.9 billion. The OEEC was instructed to reduce country requests so as to produce a total not to exceed the appropriation. That it was able to submit recommendations in September 1948 that were accepted by all member countries but Greece and Turkey was a remarkable achievement. The excess dollar deficit was eliminated by shifting planned imports from the US to non-dollar sources. Priority was given to aid requests that would finance imports of consumption goods needed to keep living standards at 1947 levels, of raw materials needed to keep industry running at existing levels, and of capital equipment and raw materials that would stimulate the production of dollar-earning or dollar-saving commodities.

In preparing the second set of allocation requests for 1949-50, the OEEC asked participating countries to assume a reduced level of funding. Its January 1949 submission requested \$4.4 billion. Congress appropriated \$3.7 billion. In August 1949 the OEEC appointed a committee to distribute the shortfall. ECA allotments were cut for all countries except Sweden and Iceland, with some participants (Germany and Belgium) suffering disproportionately. The negotiations were sufficiently difficult that it was decided to divide aid for the third year in the proportions established by the second allocation.

In the early stages of the program most countries used ECA funds to import foodstuffs and other essential materials. This conformed to American wishes: the ECA's April 1948 order on operating policies and procedures specified that initial procurement should concentrate on food, fuel and fertilizer. But it had also urged participating countries to emphasize the procurement of commodities needed to facilitate industrial and agricultural production. With the recovery of domestic production, ECA aid was used increasingly to finance the importation of capital equipment for investment projects.

1. Between April 1948 and June 1951, the Administration requested \$14.2 billion of funding, Congress authorized \$13.4 billion, and \$12.5 billion was ultimately made available. The \$14 billion figure frequently cited (viz. Hardach 1977) includes appropriations for economic assistance in Asia (mostly to colonial dependencies of the European participants).
2. Views to this effect include Brookings Institution (1951), Ellis (1950), Tinbergen (1954), Mayer (1969), Arkes (1972) and van der Wee (1986). Arkes (1972, p.241), for example, asserts that Marshall Plan assistance was "critical at the margins" and that it had a "multiplier effect of three or four times its value," but he does not specify the model in which this result obtains. Wallich (1955) similarly concludes that, while several factors contributed to German economic revival, "by providing key commodities at a critical time foreign aid probably helped to increase output by a multiple of its own value."
3. The point is put most forcefully by Milward (1984).
4. These figures exclude the U.S.S.R. UN (1949a), p.4; UN (1950), p.5.
5. Low recorded rates of saving and investment may also reflect the postwar surge of consumer durables spending, which in reality was a component of investment but showed up in the statistics as consumption. But the implications were the same: less domestic income was left for other forms of capital formation.
6. Romer (1989) and Cohen (1991) find a virtually identical coefficient on the investment share in equations they estimate to explain growth in a cross section of countries, but both authors consider longer time horizons.
7. As Paul Hoffman described the situation, "I found last year that supplying cotton, for example, for mills that did not have cotton, was just as much a recovery item as perhaps machine tools to some company that needed machine tools." Winks (1960, pp.41-42) recounts the story of a Dutch bicycle firm saved from having to shut its doors by a mere \$1,200 of Marshall Plan aid. Lauritz Hensen, President of Hede Nielsen Ltd., explained that he had the cash to buy bearings, but could not do so where kroner were acceptable currency. He appealed to his government and the \$1,200 of ball bearings were flown from the United States on an emergency order. Compare the recent story of a sock-making factory in the Soviet Union with 50 "gleaming Italian sock-making machines purchased last year for about \$15,000 each by the Soviet Ministry of Light Industry. For much of the time they stand idle because of a shortage of needles that sell in the west for a few cents. 'The ministry paid hard [Western] currency for these machines, and we paid them back in rubles [in the words of the plant manager]. But now they are saying that they don't have enough hard currency to buy the necessary needles and spare parts. As a result, we've already had to stop these machines on the evening shift and will soon have to stop the day shift as well.'" Dobbs (1991), p.18.
8. We owe this argument to Brad De Long. Points made in this paragraph are elaborated in De Long and Eichengreen (1991).

9. Coal, according to American observers, was "the major bottleneck of production" in Italy. See Federal Reserve Board (1947), p.355. The country imported three-quarters of its coal in 1950. The input-output table used, from Mutual Security Agency (1953), pp.132-133, is disaggregated to 16 sectors. Each element in the vector of final demands is reduced by the same proportion until the coal constraint is just binding. The exercise assumes that all resources made slack would have remained idle rather than being redirected to other sectors.

10. Investment, the current balance and government spending are all expressed as shares of GNP. The growth equation used was the first equation from appendix Table C2. In conducting the counterfactual simulation, we allowed only the linear terms in investment (including the separate term for Norway), the current account and government spending to operate. The interactive terms and the direct effect of the Marshall Plan were not allowed to operate. See however the simulations below.

11. It would be possible to add a fourth equation endogenizing Marshall Plan allotments. Given the structure of our model, the current year's Marshall Plan allotment depends on the current balance and other determinants. American aid then affects the subsequent year's current balance, investment and government spending ratios, and through them as well as via its direct effects the subsequent year's GDP growth. In theory there exists feedback from the induced change in the current balance to the Marshall Plan allotment; in practice, the coefficients in question are so small that they can be ignored.

12. Compare the Financial Times on August 21, 1991, describing the situation in the Soviet Union. "The state and cooperative farms, learning from last year, are now keeping their grain in store until the state is willing to pay almost any price to get it." Lloyd (1991), p.2.

13. New York Times (5 January 1947); The Economist (March 1, 1947). For a French government account to a remarkably similar effect, see INSEE (1958), p.68.

14. The Economist (July 26, 1947), p.138. Or, as the New York Times (January 1, 1949) had put it at the beginning of the year, expectations that prices would have to rise "caused peasants to withhold non-perishable products from the market, and led consumers to spend recklessly in anticipation of further price rises."

15. As the New York Times reported of the situation in France on 3 February 1947, "It is said that cattle are now as numerous as before the war but the situation is such that the producers do not wish to sell. In the first place, they are dissatisfied with controlled prices. Second, as fodder is abundant, they can keep their stock. Third, they have lost confidence in the currency. The uncertainty on future prices and the lack of fertilizer and farm machinery cause the peasant to keep his animals or sell to the black market."

16. The only noteworthy exception is stocks of virgin copper. Data on British inventories are from the CSO's Monthly Business Statistics (various issues). Data for France are from Bournay et al. (1978).

17. See the article entitled "French Premier Warns Hoarders," in New York Times (9 February 1947).

18. The Economist (July 26, 1947), p.138.

19. This example considers, for simplicity, a country whose investment, current account and government spending ratios are zero. Some of this growth would have been given back in the succeeding year: the growth rate falls in the second year by 2.1 percentage points if counterpart withdrawals for production matched Marshall Plan allotments, by 0.9 percentage points if counterpart withdrawals had been for other purposes.

20. Industrial production was expressed in logs. Foreign aid was expressed in real terms by converting it into local currency and deflating it by the consumer price index. The countries were Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Sweden and the UK; the sample period was 1948-IV through 1955-IV.

21. We continued to allow the constant and three lags of industrial production to differ across countries. A typical estimate (for Austria) was (with t-statistics in parentheses):

$$\begin{aligned} IP = & 0.56 + 0.74 IP(-1) + 1.58 IP(-2) - 1.44 IP(-3) + \\ & (0.12) (0.28) \quad (0.59) \quad (0.62) \\ & 0.22 FA(-1) - 0.17 FA(-2) - 0.02 FA(-3) \\ & (3.23) \quad (2.78) \quad (0.42) \quad DW=2.00 \end{aligned}$$

22. These findings are consistent with the pooled time-series cross-section regressions analyzed in Appendix C.

23. This is how some historians view the high growth of the first post-World War II decades. For example, Maier (1981, p.176) concludes, "For society as a whole, the politics of productivity meant simply the adjournment of conflicts over the percentage of national income for the rewards of future economic growth."

24. This is a quote from a union publication, cited in Windmuller (1969), pp.350-351.

25. International monetary stability and the absence of major supply shocks are two popular explanations for high investment in this period (Boltho, 1982). Similarly, the availability of elastic supplies of underemployed labor in Europe's rural sector, in conjunction with the influx of refugees from Eastern Europe and guestworkers from the Continent's southeast, may have enhanced labor market flexibility (Kindleberger, 1967).

26. "It is the farmers' decision to hang on to their grain, rather than any absolute shortage, which as much as anything underlies the latest US estimates that the Soviet Union will this year need to import 37m tonnes of grain." Nicholson et al. (1991), p.21.
27. Consider the following first-hand description of the situation in Lithuanian agriculture. "Since independence nobody at the kolkhoz wants to work. Everyone is waiting. Production is falling. We do not know what is going to happen." Ignatieff (1991), p.31.
28. The model is easily generalized to incorporate imports of intermediates used by industry. See Bacha (1984).
29. Using the growth of GDP rather than the growth of GDP per capita as the dependent variable made no difference for any of the empirical results. We replicated the regressions reported below using GDP per capita, and found only the slightest changes in point estimates and levels of statistical significance.
30. The MDAP was established by the Mutual Security Act of 1951, passed by the U.S. Congress in response to the outbreak of the Korean War. For 1951-52 Congress authorized \$4.92 billion in military assistance and \$1.022 billion in economic and technical assistance (known as "defense support"). Our data for foreign economic aid include only economic and technical assistance.
31. For the non-European members of this group, ancillary variables were gathered from other sources. These came from Butlin (1962) for Australia, Ohkawa and Rosovsky (1975) for Japan, and Mitchell (1980) for Canada and the U.S., supplemented by the IMF's International Financial Statistics for later years. Annual population estimates for all countries were drawn from Liesner (1989).
32. We experimented with a second lag of Marshall Plan allotments but found that it had a small coefficient, was uniformly insignificant and had no discernible impact on the other terms, including first lag of Marshall Plan transfers. Hence we report equations only equations including the first lag. To test the exogeneity of lagged Marshall Plan receipts, we added the fitted value from a first stage regression designed to explain Marshall Plan receipts. The fitted value consistently displayed t-statistic smaller than unity.
33. The result for openness is in contrast to Romer's (1990) finding for 90 countries over the period 1960-85, that more open economies had higher investment rates. The contrast may be explicable in terms of the slower and more troubled growth of international transactions immediately after World War II.
34. Since 1938 was a recession year, we reran all regressions substituting GDP growth since 1936 for GDP growth since 1938. This substitution reduced the t-statistic on the change in output since the late 1930s below 2 in the third equation in Table 1 (without changing the magnitude or significance of any of the other variables). But in none of the subsequent regressions

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