Institutions and Economic Growth in Postwar Europe:
Evidence and Conjectures

Barry Eichengreen and Pablo Vazquez[1]
September 1999

1. Introduction

It is now conventional to refer to the post-World War II era of rapid growth ending around 1971 as the "golden age." Quibbles about dates and magnitudes notwithstanding, there is no question that the first postwar quarter century was a period in which output, employment and productivity grew rapidly relative to what came before and what followed.

There is no shortage of explanations for the golden age.[2] The one with which we are concerned in this paper emphasizes the role of institutions in solving commitment and coordination problems.[3] The argument goes as follows. In a postwar content characterized by

---

[1]John L. Simpson Professor of Economics and Political Science, University of California, Berkeley; and University of Santander and Office of the Spanish Prime Minister, Madrid, respectively. An earlier version of this paper was presented the University of Groningen/Dutch Ministry of Economic Affairs/Netherlands Institute of Economic Analysis conference on productivity and living standards, Groningen, September 1998. We are grateful for the organizers of that conference (also the editors of this volume) for helpful suggestions.

[2]Two compendia of these are Crafts and Toniolo (1996) and Dumke (1997).

[3]See Eichengreen (1996). Analyses in a similar spirit include Landesmann and Vartianen (1993), Hargreaves Heap (1994) and Przeworski and Wallerstein (1982). Part of the difficulty of relating this paper to kindred work is that similar concepts are referred to by different names. Where we refer to "commitment and coordination problems," for example, Hargreaves Heap uses the phrase "prisoner's dilemma and coordination games." Przeworski and Wallerstein refer to bargains between capital and labor as "class compromises" and stress the need for capitalists to "consent to institutions that would make it reasonably certain that wages would increase as a function of profits according to some rule..." (p.218). Boyer and Mistral (1992) uses the term "Fordism" to refer to the cooperative structure of industrial

(continued...)

severe capital shortage and a backlog of unexploited technologies, investment was the one indispensable ingredient for growth. Net investment rates in 1950-1970 were nearly twice as high as in 1920-40. This was a period of "extensive growth," not in the narrow sense that additions to output were associated exclusively with additions to the stock of capital and labor inputs, but in the broad sense that returns to capital and labor were not strongly diminishing and that productivity advance could be achieved by emulating best practice in the United States.

But this additional investment had to be financed, and once financed it had to be sensibly allocated. Here wage moderation and export growth were key. Wage moderation stimulated investment by enhancing its profitability and making available the resources to finance it. The opening of the European economies, whose exports expanded even faster than their output, provided an incentive to allocate investment to sectors where the returns were highest -- to those sectors, in other words, in which the country had a comparative advantage. It allowed capacity to be expanded without being constrained by domestic demand.

This is where institutions came into play. Europe's postwar growth benefited from institutions that solved commitment and coordination problems in whose presence neither wage moderation nor the rapid expansion of trade would have been possible. Domestically, institutions disseminated information and monitored the compliance of economic interest groups with the terms of their agreement to moderate wage claims and boost investment. They created bonds that would be lost in the event that any party reneged and coordinated the

---

[3](...continued)
relations and equitable division of productivity gains in Europe after World War II.

terms of the agreement across sectors of the economy. Internationally, institutions coordinated the restoration of current account convertibility across countries and cemented national governments' commitment to openness, encouraging countries to restructure along export-oriented lines and more fully exploit their comparative advantage.

In this paper we report new evidence that speaks to this interpretation. We utilize newly-developed measures of the structure of labor-management relations and of the institutional commitment to external opening. The results are consistent with the importance of investment and exports for growth, of international institutions for the expansion of exports, and of the institutions of labor-management relations for the wage moderation that supported the investment.

In addition, we extend this interpretation in new directions, developing its implications for technology policy. Building on work by Kitschelt (1991) and others, we suggest that Europe's postwar institutions were better adapted to absorbing the backlog of existing technologies available after World War II than they were to supporting innovation.[4] If the 1971-73 watershed can be seen as a transition to "intensive growth," not in the narrow sense that all growth in output per worker was now rooted in domestically-generated technological progress but in the broad sense that growth now depended more heavily on innovation than it had in the preceding quarter of a century, then it appears that the institutions inherited by the Europe of the 1970s were less than ideally suited to the task. Similarly, labor market

[4]Soskice (1996), while also emphasizing the institutional prerequisites for technological change, takes a rather different approach to the same issues, mainly because he focuses on a later period.

institutions that were well suited to the high-growth 1950s and 1960s functioned less well in the less buoyant 1970s and 1980s.

No single paper can verify all these conjectures. This paper is best read as one in a series, each of which adds color to a larger canvas.[5]

2. Facts

Table 1 provides an eagle-eye's view of Europe's growth. The most striking feature of the top panel, which reports GDP growth for various sub-periods, is that between 1950 and 1971 the 12 Western European economies grew by 4.7 per cent per annum, more than twice as fast as over the century and a half since 1820.[6] Over the second sub-period from 1973 through 1992, growth averaged 2.2 per cent per annum, almost exactly the average over the entire 172 years since 1820. Aside from the golden age, only in 1870-1913, the last period of marked internationalization when the growth of foreign trade, foreign investment and international migration outstripped the growth of production, did output growth in Western Europe also reach the 1820-1992 averages.

The same fluctuations are evident in Southern Europe, where the pattern of acceleration and deceleration is if anything even more dramatic.[7] While growth over the entire

---

[5]In addition to the above-mentioned paper, see Eichengreen (1994) and Eichengreen (1998).

[6]Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and the UK.

[7]Greece, Portugal, Spain, Turkey and Ireland (following Maddison, who groups economies as much by their initial economic structure — by, inter alia, the importance of

(continued...)

period since 1820 is essentially the same as in Western Europe, the postwar acceleration is more pronounced. Growth is fully three times as fast in 1950-73 as over the period as a whole. While Southern Europe also experienced the post-1973 slowdown, growth there is still 50 per cent faster in 1973-92 than the period average. Even more than in Western Europe, then, the second half of the 20th century, and especially the 1950-73 period, stands out.[8]

Table 2 disaggregates by country. It shows that extensive growth was fastest in Germany, Austria and Italy, reflecting Germany's postwar *Witschaftswunder*, Austria's economic and geographic proximity to its larger neighbor, and (Northern) Italy's success in catching up with the continent's high-income regions. It was slowest in the United Kingdom, a problem that by the 1970s had given rise to a literature on that country's "economic failure." While the U.K. continued to underperform the Western European average after 1973 (with the economy's dismal performance in the 1970s swamping its improved performance in the 1980s), the change in per capita income was every bit as slow in Switzerland, Sweden and the Netherlands. In Southern Europe, meanwhile, the golden age was brightest in Greece and

---

[7](...continued)
agriculture and initial income — as by proximity to the Equator).

[8]Figures are also provided for Eastern Europe, although this region is not the subject of the present paper. There is also some evidence of the operation of the extensive-growth model there, although the figures for the region should be taken with several grains of salt. The bottom panel of Table 1 compares the growth of output per capita in the different regions. Here, Western Europe compares even more favorably, since it consistently featured the lowest rate of population growth.

Iberia, least so in Turkey and in Ireland, while the post-1973 slowdown was least dramatic in these last two countries.[9]

Table 3 decomposes growth into the contributions of capital, labor and technological change.[10] Germany's position in the 1950s at the top of the growth league reflects the rapid growth of inputs (fast growth of the labor supply and high investment rates), but also the rapid growth of productivity. Technological progress is also rapid in Italy, reflecting that country's success at closing the productivity gap vis-à-vis Europe's high-income countries. Britain's poor performance is seen to reflect both low investment rates and disappointing productivity growth. France stands out for the stagnation of its labor force.[11]

Growth accelerated further in the 1960s.[12] The rate of growth of output per employed person jumped from 3.6 per cent per annum in the 'fifties to 4.2 per cent in the 'sixties (Table 4).[13] Investment was maintained at high levels, and the countries of Western Europe remained

---

[9]Indeed, Ireland and Turkey were the best performers in Southern Europe in the years of intensive growth.

[10]Based on a Cobb-Douglas production function with a coefficient of 0.7 for the labor force.

[11]While French policymakers were much concerned about this "Malthusian" problem, Table 3 suggests that the country's impressive productivity performance (behind that of only Germany and Italy) sustained more-than-respectable rates of output growth.

[12]We should entertain the possibility that causality ran in the opposite direction, from faster growth enjoyed for independent reasons to willingness to participate in a free-trade area. Lamfalussy (1963) considers this question and concludes in favor of the interpretation in the text. We return to this issue below.

[13]The acceleration GDP growth was more modest, rising from 4.5 to 4.7 per cent per annum, reflecting the falling rate of growth of employment.

net importers of capital.[14] Much of this foreign investment from the United States was associated with technology transfer in chemicals, computers and transport equipment. Investment ratios rose further, although much of the additional outlay was needed to make up for depreciation of the now-larger capital stock and was devoted to housing and consumer durables spending by now-wealthier households. Meanwhile, labor force growth was sustained by the movement of workers to the industrial regions from Mediterranean Europe and North Africa. Only in Austria and West Germany, where growth had been fastest, was there a clear slowing down between the 'fifties and the 'sixties. In Belgium, Denmark, France and Norway, all relatively poor performers in the 1950s, there was an acceleration.[15]

In Southern Europe, growth accelerated to even higher levels as Greece, Portugal and Spain began the process of liberalizing and opening to Europe and the world. In Spain, the pivotal event was the tariff of 1960, under which half of all barriers to imports from OECD countries were removed.[16] For Portugal the pivotal event was joining EFTA. Greece negotiated an association agreement with the EEC (as did Spain). Rather than shunting these

---

[14]With the exception of the U.K. and, toward the end of the period, West Germany and Italy.

[15]Norway finally reaped returns on expensive infrastructure investments undertaken in earlier years. France, previously saddled by controls, cartels and public enterprises, benefitted disproportionately from the liberalization of trade. Denmark, where trade liberalization in the 'fifties had created serious problems for an industrial sector which had been generously protected since the 1930s, now reaped the benefits of industrial rationalization (inefficient firms closed and their more efficient counterparts merged, leading to increased productivity and a greater ability to reap economies of scale), allowing increased production and exports of engineering and electrical equipment and of the products of the brewing industry.

[16]Spain was the only country where the growth of exports lagged the growth of output in the 1950s.

countries into the agricultural backwater, opening was associated with rapid growth of labor-intensive manufactures.[17] In Spain industrial production expanded at an annual rate of 10.2 per cent, the service sector by 6.7 per cent and agriculture by 2.3 per cent per year from 1960 through 1973, as labor was shifted from low-productivity agriculture to high-productivity manufacturing, and as capital goods were imported from abroad.[18] With Austrian and German growth declining from higher levels and the pace picking up in these other countries, the norm became expansion by 4.5 per cent per annum, fully twice the historical average. Only Britain failed to share in the phenomenon, output per worker there growing per annum by a meager 2.5 per cent.[19]

All in all, this review of the record confirms that there is indeed a golden age to be explained.

---

[17]In part this reflected the fact that trade in agriculture was less than free. Among the first concrete achievements of the EEC was its Common Agricultural Policy, under which trade in foodstuffs was restrained, and the EFTA agreement was initially limited to industrial goods.

[18]Harrison (1993), p.23.

[19]Growth was also disappointing in Ireland and Denmark, in part because both countries were dependent on the slowly growing British export market. But the fact that the incremental capital-output ratio was so high in Ireland suggests that supply-side problems existed there as well. These can be attributed to the kind of fragmented industrial relations system also familiar in the U.K. (see the discussion to follow). In addition, the fact that Ireland and Denmark were heavily agricultural meant that they encountered particular difficulties in penetrating the protected domestic markets of other countries.

3. Hypotheses

Lancaster (1973), Grout (1984) and van der Ploeg (1987) model a dynamic game between capital and labor. Welfare is maximized when capitalists and workers agree to trade current compensation for future gains. Workers moderate their wage claims in order to make profitable investments in capacity modernization and expansion. Capitalists restrain dividend payout in order to reinvest. Investment stimulates growth, raising the future incomes of both capitalists and workers. In the cooperative equilibrium in which workers and capitalists exercise restraint, the costs of foregoing current consumption are dominated by the benefits of the future increase in incomes.

This cooperative equilibrium may be impossible to sustain, however, for the sequencing of events renders it time inconsistent. If investment requires liquidity and liquidity requires profits, then workers must restrain their wage demands now in order to make profits available to capitalists for investment later. But once the wage restraint has occurred, capitalists are even better off if they renege on their agreement to invest, paying out profits as dividends instead. Since investment is no higher than if they had failed to moderate their wages, workers have no incentive to exercise restraint. In this noncooperative equilibrium, workers pursue wage increases, management pays out profits as dividends, and investment and growth are depressed.

Even if workers can be convinced of capital's willingness to invest, unions may be tempted to recontract after the investment has taken place. If workers renege and appropriate the surplus created by the additional investment, profits will be no higher than if management had failed to invest, and management has no incentive to plow profits into investment. In the

noncooperative equilibrium, workers pursue wage increases and management pays out profits, causing investment and growth to lag.

A contract that binds capitalists to invest and workers to restrain wages can therefore leave both groups better off. The social and economic institutions developed in Europe after World War II can be thought of as serving this function.[20] Institutions worked to monitor the compliance of capitalists with their deferred contribution to the bargain and to disseminate evidence of noncooperation; by reducing the likelihood that shirking would go undetected, these mechanisms reduced the temptation to indulge in noncooperative behavior. Institutions were used to create “bonds” that would be lost in the event of reneging, "bonding" the participants and providing a further deterrent to shirking. By committing capital to invest the profits made available by wage restraint, they provided labor the incentive to moderate their wage claims. By committing labor to continue to exercise restraint rather than "scooping" profits, they provided capital the incentive to invest. Long-term contracts, pacts between the social partners and government, and statutory wage and price controls can all be thought of as precommitting unions to wage moderation and inducing management to invest. Unemployment, health and retirement programs -- the institutions of the welfare state, in other words -- served as bonds that would be jeopardized if labor reneged.

The centralization and concertation of sectoral wage negotiations further encouraged wage moderation. Insofar as one firm's earnings could pass through the capital market and finance another's investment, the benefits of wage moderation by any one group or union accrued to other workers. Since the level of wages affected economy-wide determinants of

---

[20]A la North (1993) and North and Weingast (1989).

investment like the interest rate, there was a need to coordinate wage demands across sectors to render a bargain to moderate wage claims attractive to each party to the accord.[21]

On the employer side, any one firm contemplating investment had to worry that its decision to invest would encourage its workers to raise their wage demands in order to appropriate the extra profits generated by the investment. But if wages were determined in economy-wide rather than enterprise-level negotiations, an individual firm's investment decision would no longer affect the wages it had to pay. In these circumstances, centralized wage negotiations led to a higher level of investment and, insofar as productivity was raised, to higher wages in equilibrium.[22]

For deferring consumption to be worthwhile, investment had to be productive. For investment to stimulate growth, in other words, there had to be a market for the goods produced by industries whose capacity was augmented and whose efficiency was enhanced. Here the post-World War II expansion of trade was key. International trade -- for European countries intra-European trade in particular -- allowed countries to specialize in sectors in which they had a comparative advantage without regard to limits on the demand for their products at home. It allowed them to rely on cheap foreign inputs that were impossible or uneconomical to produce domestically.

But reallocating resources along lines of comparative advantage could turn out to be a costly mistake if one's trading partners reneged on their commitment to openness.

---

[21] Otherwise a prisoner's dilemma could arise in which any one sectoral bargaining unit would agree to moderate its demands only if it expected others to do the same, but in the absence of an agreement to harmonize demands no one had an incentive to be moderate.

[22] These possibilities are modeled by Hoel (1990).

Encouraging the expansion of steel production on the assumption that coal and iron ore could be imported from abroad, for example, could be a costly error if foreign supplies were not forthcoming. Augmenting the capacity of such industries would not pay if other countries refused to reduce their tariffs. Before encouraging the rationalization of domestic production along lines of comparative advantage, governments consequently had to be convinced that their partners' turn to openness was permanent.

Here again institutions solved commitment and coordination problems. The European Coal and Steel Community created monitoring and surveillance technologies that guaranteed the French steel industry access to German coal and German industry access to French iron ore. A Joint High Authority monitored the compliance of participating countries to the terms of their agreement. The European Payments Union (EPU) coordinated the simultaneous move of European countries to currency convertibility for intra-European current-account transactions and committed the participants to a sequence of trade liberalization measures. The EPU Managing Board monitored the policies of member countries in order to discourage them from reneging on their commitments.[23] Compared to unilateral convertibility, then, the payments union was a more credible commitment mechanism.[24]

---

[23]The participants contributed currency and credit to the EPU's central fund; access to these resources was contingent on their adherence to the EPU agreement, which thereby served as a bond.

[24]How, it might be asked, does our thesis that the institutions of European integration and industrial relations helped to solve commitment and coordination problems that would have otherwise prevented Europe from achieving the wage moderation, high investment and rapid export growth that were key ingredients of its postwar growth process differ from previous work? Most previous analyses of corporatist labor relations (e.g. Crouch 1985, Bruno and Sachs 1985) have concentrated on short-run wage and employment dynamics (the

(continued...)

4. Evidence on Labor- and Trade-Related Institutions

Institutions were not equally well adapted to the imperatives of postwar growth in all European countries. The U.K. and Ireland essentially failed to develop the requisite arrangements while France and Italy did so only with delay. In these countries, wage pressure was intense, and investment was stifled. Some countries, of which France is a prime example, were slow to restructure along export-oriented lines and to capitalize on opportunities for export-led growth.

This section exploits the fact that institutional arrangements differed to analyze their connection with growth performance more systemically.

A. Output

No consensus exists among macro-econometricians on the importance of institutions for economic growth. Two recent studies, Crafts (1992) and Grier (1993), reach broadly negative conclusions about the importance of institutionalized bargaining. Yet other studies which consider a broader range of institutions, viz. Knack and Keefer (1995, 1996) and La Porta et al. (1997), report rather more supportive conclusions. It is fair to say that the jury is still out.

To maximize comparability with previous studies, we take the data and specification in Grier (1993) as our starting point. Grier uses data for 24 OECD countries for the period

---

[24](...continued)
response of wages and unemployment to supply shocks in more and less corporatist economies, for example). Our focus, in contrast, is on wage, employment and output trends over the intermediate run. Similarly, previous work on regional trade arrangements has concentrated on short-run trade creation and trade diversion; our concern, in contrast, is with the implications for medium-term export performance.

1950-88.[25] We follow him by drawing output data from the Heston-Summers Penn World Tables (in our case Version 5.5), but drop Iceland, Luxembourg and Turkey as special cases unlikely to shed much light on the dynamics of European growth.[26]

Grier relates the rate of growth of GDP to output per capita at the start of the period (per capita GDP in dollars at purchasing power parity), the rate of population growth, the standard deviation of inflation, and the ratio of government consumption to GDP.[27] Per capita output should enter negatively if catch-up is important. Population growth should enter positively, since the dependent variable is the rate of growth of aggregate output. While growth should decline with the variability of inflation, the sign of the coefficient on the average inflation rate is not obvious a priori.[28] Government consumption should enter negatively if it crowds out more productive uses of resources.

---

[25]The 24 countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Japan, Iceland, Ireland, Italy, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the U.K. and the U.S. Grier takes five-year averages of country data (except for a three year average for 1985-88) and pools the cross sections.

[26]Data on the volume and value of exports (including re-exports) are taken from the OECD's National Accounts Statistics and Statistical Bulletin. The share of exports destined for European and OECD countries is drawn from the Statistics of Foreign Trade of the OECD (Series A).

[27]We include fixed effects for periods in each of the equations reported.

[28]Motley (1994) suggests that inflation may depress growth by diverting resources into unproductive uses such as changing wages and prices more frequently, economizing on holdings of non-interest-bearing assets, etc. Grier measures average inflation as the first difference of the period average on the grounds that first differences are more likely to isolate the unexpected changes in inflation that may be important for output. The results we report here take the more straightforward approach of using the period average rate of inflation.

In most of our regressions we include both the investment/GDP ratio at the start of the period and the period-average rate of growth of investment, anticipating positive signs on both.[29] We consider several measures of exports: the export/GDP ratio at the start of the period, the growth rate of total exports, the growth of exports going to EU countries, and the growth of exports to all of (OECD) Europe.[30]

The first equation in Table 5, estimated by ordinary least squares, replicates Grier's basic result.[31] Most of the variables enter with the anticipated signs and with coefficients that differ significantly from zero at standard confidence levels. Initial GDP enters negatively as predicted by the catch-up hypothesis. The growth of government consumption is negative, as if it crowds out other more productive forms of spending. The investment ratio is positive and significant, as anticipated. The variance of inflation is negative and significant, population growth positive and significant.[32]

---

[29]Grier measures investment by its share of GDP. Since including the rates of growth of investment and exports in the output equation creates the possibility of simultaneity bias, we in general treat all our investment and export variables as endogenous.

[30]For our purposes, OECD Europe includes, in addition to members of the EEC/EU (depending on time period) Austria, Finland, Norway, Sweden, and Switzerland.

[31]t-statistics reported in this paper are calculated using heteroskedastic-consistent standard errors.

[32]Aside from some of the fixed effects, average inflation is the one variable whose coefficient does not differ from zero at standard confidence levels. We measure this variable as the period average of the annual log difference of the purchasing-power-parity price level in each country plus the annual log difference in the U.S. GDP deflator, since the Heston-Summers PPP price level is measures relative to the U.S. price level. Levine and Zervos (1994) and Motley (1994) similarly fail to find that inflation is significantly related to growth.

Since growth plausibly encourages investment as well as investment encouraging growth, we re-estimated using instrumental variables.[33] The results, shown in the second column, differ little. One noteworthy difference is that the coefficient on inflation now differs from zero at the 90 per cent confidence level.

Equation 3 adds two measures of capital formation -- the rate of growth of investment at constant prices and the initial investment ratio — along with export growth. All three coefficients are significantly greater than zero at the 90 per cent level or better, consistent with our hypothesis of the proximate sources of Europe's growth. The importance of exports for growth is consistent with Edwards' (1998) review of the literature linking openness to economic growth.

We also tested whether the growth of exports to the countries that committed to regional trade liberalization by forming the European Coal and Steel Community (ECSC) and the European Economic Community was more important than exports to the rest of the world.[34] While ECSC and EEC members may have been willing to liberalize trade more quickly than other countries by virtue of the success of European institutions in solving commitment and coordination problems (in which case our measures of the effects of the

---

[33]As instruments we use the exogenous variables employed in our investment, export and wage equations below. The other equations reported subsequently are also estimated using instrumental variables.

[34]The relative importance of intra-European trade was measured as the percentage change in the value of exports to ECSC/EEC markets (EEC markets for short) relative to the percentage change in the value of total exports. We allowed the countries included in this subcategory to change with time as additional countries joined the EEC. Henrekson, Torstensson and Torstensson (1997) also consider the impact of EC and EFTA membership on GDP growth, reporting a positive effect of European integration on long-run growth rates.

ECSC and EEC below should have a significant impact on the expansion of exports), there is no obvious reason why exports to specific markets should have been particularly conducive to growth. Thus, when the growth of both total and intra-EEC exports is included, as in Equation 5, it is total exports, not intra-EEC exports, that matter for overall economic growth.[35]

In Table 6 we split the period into the 1950s-1960s and 1970s-1980s. The effects of catch-up are more pronounced in the first subperiod, as expected. Export growth also plays a more important role in the first subperiod, consistent with the hypothesis that trade was a particularly important engine for growth in the golden age. The larger coefficient on inflation (in absolute value terms) is consistent with the emphasis we place on wage moderation for supporting the postwar growth miracle.[36]

B. Exports

The next step in our argument involves the link from domestic and international institutions to the export growth and investment that fueled the postwar growth miracle. Two arrangements affecting exports were the European Payments Union which preceded the restoration of current account convertibility, and the European Coal and Steel Community (ECSC) which developed into the European Economic Community (EEC). We construct a dummy variable for countries which belonged to the ECSC and/or the EEC, denoted "EEC,"

---

[35]Interestingly, when we add exports to all European markets, this term dominates the other export measures.

[36]We would have also expected larger coefficients on the investment terms in the first subperiod than the second; this is the one expectation that is disappointed.

and a second for countries which participated in the EPU or whose currencies were convertible for current account transactions, denoted "EPU."[37]

Previous studies have tended to find some effect of European economic and monetary integration on the pattern of trade. Frankel (1992) includes a dummy variable for EC member states in his gravity equations for bilateral flows, finding that membership encouraged intra-EC trade even after controlling for income, population, distance and contiguity, but without discouraging trade between EC members and the rest of the world. Eichengreen (1993), in an analogous exercise for the EPU in the 1950s, obtains similar results. Aitken (1973), also utilizing a gravity framework, finds that EEC membership significantly stimulated trade between member countries starting in the early 1960s. He detects little sign that membership in the European Coal and Steel Community boosted trade in the 1950s, however. De Grauwe similarly considers bilateral trade flows among ten industrial countries since the 1960s. He finds that EC membership significantly increased trade among the six founding members in the 1960s but no longer had a discernible effect in the 1970s, a contrast which he attributes to increased trade diversion following the admission of three new members in 1973. He does, however, find a strong trade-stimulating effect of membership in the 1970s for the three new entrants themselves.

Table 7 summarizes the results of regressing the growth of export volumes on the growth of GDP, population growth and the stance of domestic and international policies.[38] In

---

[37]Information on the latter was drawn from the IMF's Exchange and Trade Restrictions Yearbooks.

[38]We focus on total exports as our dependent variable, although we also analyzed the

(continued...)

equation 1, the coefficient on ECSC and EEC membership (captured by the composite variable "EEC") is positive and significant at the 95 per cent level, supporting the notion that the institutions of European integration solved commitment and coordination problems hindering the expansion of trade. In addition, the growth of exports depends, as expected, on the growth of GDP. We also include the level and variability of inflation as two measures of domestic economic policies which might have crowded out exports. Average inflation enters with the expected negative sign, but inflation variability, unexpectedly, enters positively.

Equation 2 adds the dummy variable for countries which were EPU members or whose currencies were convertible on current account.[39] Its coefficient is insignificantly different from zero at standard confidence levels, while the coefficient for ECSC/EEC membership retains its size and significance.[40]

---

[38](...continued)
determinants of intra-European exports. The results do not differ significantly. Given the importance of exports for GDP growth, the latter is treated as endogenous. A related issue is whether it is appropriate to also treat our EEC and EPU dummies as endogenous. There are good reasons to think so: the level of trade with other participants may well influence the attractiveness of joining a regional arrangement. Countries which trade more heavily with one another may want to establish institutional relations to lock in those benefits. How the growth rate of trade may affect the decision to join is not entirely clear: rapid growth that foreshadows an even higher trade ratio in the future may magnify the benefits just described, but lagging trade growth may also heighten the perceived need to join in an institutional arrangement so as to reverse the slump in trade. While these arguments do not predict that endogeneity will bias OLS coefficients in a particular direction, they all suggest treating the EPU/convertibility variable as endogenous, as we do below.

[39]We identified the date when current-account convertibility was restored using the IMF's Exchange and Trade Restrictions volumes.

[40]Thus, when convertibility is measured as in Equation 1, only the coefficient on the Coal and Steel Community is significantly greater than zero at standard confidence levels. When convertibility is measured by acceptance of the IMF's Article VIII, in contrast, only
(continued...)

The insignificance of the EPU/convertibility measure could conceivably reflect imprecision in how we have dated the restoration of convertibility. In Equation 3 we therefore substitute the date when countries accepted Article VIII of the IMF Articles of Agreement. This fails to alter the finding.

To test whether the effects of the EPU differed from those of the unilateral restoration of convertibility, we include in Equation 4 separate proxies for EPU membership and current account convertibility. The results are striking: EPU membership has a strong positive effect on trade (consistent with results obtained in Eichengreen 1993, using an entirely different methodology), while the adoption of current account convertibility at the end of 1958 has a negligible effect. Again, this is strongly consistent with the emphasis placed in our interpretation on the role of collective European institutions (in this case, the European Payments Union) in solving commitment and coordination problems in the first postwar decade.

We can similarly distinguish the relative importance of the ECSC before 1959 and in the EEC subsequently by including separate variables for the participation in the ECSC and the EEC, as in equation 6. While both positively influence the volume of trade, the ECSC dummy is larger, and only it differs significantly from zero at standard confidence levels. Again this points to the critical role of European institutions in the immediate postwar years.

---

[40](...continued)
post-1958 EEC membership is significant.

Table 8 breaks the sample at 1970. With the smaller samples, the coefficients on the institutional variables of interest are less precise. But there are still some suggestive contrasts. Equation 4 confirms that it is EPU membership and not current account convertibility that does most of the work and that the effect of these variables are evident only in the earlier subperiod. Similarly, equation 6 shows that the effects of the ECSC and EEC membership (which were negligible in equations for the full sample period) are pronounced in the 1950s and 1960s.

Together, then, the results of this section confirm the significance of the EPU and the ECSC in promoting the growth of Europe's trade in the first postwar decade.

C. Investment

The next step is to consider the determinants of investment. We are especially interested in the relationship between labor's share of national income and the investment rate.

Our investment equation follows Barro (1991) and Wolf (1995), who analyze investment in a cross section of countries. Barro focuses on the effects of initial GDP per capita, human capital, government consumption as a share of national income, and various proxies for relative price distortions (the average price of investment goods relative to other goods and services, and the standard deviation of that ratio).[41] Wolf considers tax rates,

[41]Barro also includes revolutions and assassinations per capita as measures of political instability; we exclude these on the grounds that they are mainly applicable to the developing countries in his sample.

interest rates, Tobin's q, and political conditions. We add labor's share of GDP as the (inverse of the) measure of profitability suggested by the neoclassical model.[42]

The estimates in Table 9 support our emphasis on labor's share as a determinant of investment.[43] This variable consistently enters with a negative sign which differs from zero at the 99 per cent confidence level. The other variables generally affect investment in plausible ways. For example, investment is negatively related to the growth of the share of government consumption. In two of the three models it is negatively associated with the real interest rate (the rate on government bonds adjusted for the change in the CPI deflator), while the change in Tobin's q (the market valuation of capital relative to its replacement cost, as measured by the percentage change in share prices relative to the percentage change in wholesale prices) has its expected positive effect.

Breaking the sample into subperiods, as in Table 10, suggests that while the change in labor's share has mattered throughout the postwar period, its coefficient is consistently larger for the 1950s and 1960s than for the 1970s and 1980s. The variability of labor costs similarly appears to have a negative impact on investment in the first subperiod but not the second.[44]

---

[42]For discussion, see Clark (1979) and Kashyap, Stein and Wilcox (1993). We construct our labor income variable using the OECD National Accounts volumes and the International Labour Organisation's Yearbook of Labour Statistics (various years).

[43]Labor costs are computed as labor income per member of the labor force.

[44]In addition, we find that investment was driven by government spending and political instability in the first period, but by corporate taxes, Tobin's q, and real interest rates in the second. This makes it tempting to argue that investment depended more heavily on politics and public policies in the first period but more heavily on financial-market conditions in the second.

Overall, then, the results tend to support our emphasis on the importance of wage restraint for sustaining the high levels of investment that were a crucial ingredient of Europe's postwar growth recipe.

D. Wages

A large literature is concerned with the role played by labor-management relations in macroeconomic outcomes (see for example Bruno and Sachs 1985, Calmfors and Driffill 1988, Crouch 1985), much of it emphasizing the connection between corporatist governance and wage bargaining. While fewer authors focus on the connection between the centralization of bargaining and labor-market outcomes, our interpretation suggests that centralization can serve as an alternative to (or possibly complement) corporatism in solving coordination problems.

A limitation of much of this work is that it uses snapshots of corporatist structures at a point in time, generally the late 1970s and early 1980s, to analyze bargaining rounds stretching over several decades, when the relevant institutions in fact changed markedly over time. For the present study, in contrast, we constructed indices of corporatism and the centralization of bargaining separately for each five-year period.

Our specification relates the rate of growth of money wages to inflation, demand pressure (the deviation of log output from trend), the growth of real GDP per worker (as a measure of labor productivity), the growth of the labor force, and the rate of growth of investment.[45] Table 11 confirms that wages grew more slowly where investment grew quickly, as predicted by our analytical framework. Wage growth was slower where the growth of the

[45]Investment is again treated as endogenous.

labor force was faster, consistent with Kindleberger's (1966) elastic-labor-supplies hypothesis. Not surprisingly, wages increase with productivity and inflation.

We include in these equations two measures of corporatism, one based on our own reading of primary sources (newspaper accounts, trade union reports, etc.) and one based on Colin Crouch's. (Specifically, it quantifies Crouch's (1993) description of changes in labor relations since the 1950s.) In the first equation of Table 11, the coefficient on the Crouch index is negative and significant, consistent with the notion that more corporatist economies were characterized by more moderate wage growth. In the second equation, which instead uses our own index, the relevant coefficient is still negative but now significant only at the 90 as opposed to the 95 per cent confidence level. The third equation substitutes a measure of the centralization of wage bargaining, since Section 3 suggested that corporatism and centralization were alternative means of solving commitment and coordination problems. The coefficient on this index has the anticipated negative sign and is strongly significant.

When we include both centralization and corporatism, as in the fourth equation, centralization dominates. When we break the sample at 1970, we find that centralization matters throughout the postwar period; interestingly, there is support for the importance of corporatism (however measured) mainly in the second subperiod.

Table 13 is an exercise in sensitivity analysis. In the first equation corporatism is measured using a version of the Bruno and Sachs index (denoted $Corp_1$); it is taken as the sum of a vector of zero-one variables measuring union centralization, employer centralization, low

shop floor autonomy, and works councils.[46] This variable enters with a significant negative sign. The second equation measures corporatism as the product rather than the sum of its four constituents in an attempt to test whether its effects hinge on the presence of all four components; this index, $Corp_2$, also enters with a significant negative coefficient. The third equation measures corporatism as the average of $Corp_2$ and the share of the labor force unionized; this measure, $Corp_3$, is negative but not significant at standard confidence levels. Finally, the fourth equation measures corporatism as the average of $Corp_3$ and a measure of the stringency of incomes policies ranging from zero to one; this measure, $Corp_4$, is significantly negative. Table 12, which breaks the sample, suggests that unionism and incomes policy were particularly effective in allowing European economies to coordinate on equilibria that involved wage moderation in the golden age as opposed to the post-1970 period.

To see which elements of labor-management arrangements were most important for restraining wage inflation, we entered the components of these indices separately in Table 13. Consistent with previous findings, measures of worker and employer centralization appear to have been relatively important in supporting wage moderation. Table 14 does not suggest significant differences in their impact in the first and second subperiods.

Thus, evidence derived using various different measures of the institutionalization of labor-management relations supports the hypothesis that centralization and perhaps also corporatization played a significant role in moderating wage demands.

---

[46]Normalized to range from zero to one. All of the other indices we construct below are similarly normalized to the zero-one range.

5. Institutions and Technical Change

Previous sections have emphasized the institutional determinants of output, investment, exports, and wages. But institutions mattered not just for macroeconomic outcomes but for the microeconomics of technical change as well. In this section we develop this other dimension, offering some conjectures about institutional determinants of technical change.

A. Institutions and Technology Transfer

Johnson and Stafford (1998) offer the following characterization of post-World War II technology. In the immediate postwar years, an increasing number of market organizations applied the techniques of scientific management to their operations. Tasks were simplified by an extensive division of labor, increasing the demand for unskilled and semi-skilled labor and leveling the distribution of income. Technologies making intensive use of heavy machinery, raw materials and less-skilled labor and presupposing the existence of a large domestic market, developed in the United States in the course of previous decades, could be "taken off the shelf" by producers in other countries seeking to expand capacity and raise productivity.[47]

As emphasized by Wright (1990), the U.S. economy's dependence on material-using technologies and goods produced for the mass market increased continuously from 1880 through World War II. And as argued by Kogut (1992), the concept and practice of professional management originated in the United States, circa 1900. Similarly, staffing large firms with a cadre of professional middle managers was almost exclusively an American

---

[47]On the nature of American technological leadership in this period see Nelson and Wright (1992).

phenomenon. This American recipe for industrial success was epitomized by the automobile industry which, following Henry Ford, produced for a mass market using an extensive division of labor and heavy inputs of steel and energy.

While the automoble industry was perhaps the most dramatic case where the United States opened up a productivity lead in the years preceding World War II, that productivity advantage was general. According to Maddison, labor productivity in Europe was a mere 40 per cent of U.S. levels in 1950.[48] The gap did not reflect any intrinsic inefficiency of European labor: insofar as Europe possessed Abramovitz's capability for catch up, the gap could be closed by importing the latest U.S. techniques, which in practice meant mass-production, scientific-management-based techniques, and by equipping European workers with U.S. levels of capital equipment. This is not just an historian's interpretation; it was the view of contemporaries, notably of the U.S. officials who made visits by European bureaucrats, industrialists and trade unionists to American factories an obligatory part of the Marshall Plan in order that they might observe the techniques of mass production and scientific management on the shop floor. European officials acknowledged this by giving priority in early postwar planning to iron and steel, transport equipment, and non-electrical machinery, sectors in which capital intensity and scientific management were particularly important. And national trade unions and employers associations were, for the reasons described in Section 3 above, ideally suited for delivering the wage moderation and high investment needed to support the expansion of capacity in these sectors.

---

[48]Denison's early estimates are consistent with Maddison's. In addition, Denison suggests that the gap in total factor productivity was nearly as large. See Denison (1967).

B. Institutions and Incremental Innovation

To be sure, it would be an exaggeration to say that Europe's task was simply to emulate the U.S. example. American technology had to be adapted to European circumstances, notably shorter production runs and more costly raw materials. The liberalization of intra-European trade could loosen the market-size constraint but not eliminate it. Similarly, the liberalization of trade in raw materials could weaken America's comparative advantage in raw-material-intensive activities without overturning it. Adaptation to European conditions was still required.

Here too institutions had a role. Perrow (1984, 1986) and Kitschelt (1991) have suggested that certain institutional arrangements are particularly conducive to the kind of incremental innovation that was important in the early postwar years. Industries like iron and steel tend to be characterized by "tight coupling," "linear" technology and low uncertainty, in their parlance. Tight coupling means that each step or component of the production process is difficult to separate from the others. Linearity means that it is easy to understand the system's operation, to learn from feedback signals, and to keep outputs under control. In tightly-coupled, linear systems, innovation will tend to be global (since coupling discourages localized change) and incremental (since the linear nature of the process encourages continuous adaptation). Global innovation requires a heavy dose of capital for investment and concertation among stakeholders, all of whom must agree to the changes affecting the entire system. Again, in the immediate postwar period European institutions fit the bill. The wage moderation needed for high investment and the concertation needed for global adaptation were facilitated by corporatist arrangements and centralized bargaining. The skills needed to

adapt and incrementally modify existing technologies could be conveyed through Northern European countries' existing systems of technical education and apprenticeship training. Cohesive employers associations discouraged firms from poaching workers, preventing skills with industry-wide applicability from being undersupplied. The absence of high-powered incentives within the firm implied a preference for bank rather than securitized finance of the sort that Europe's bank-based financial system was in a position to supply. The need for consensus decision making to support global innovation implied that long-term financing via stable shareholding and bank-delegated monitoring worked better than securitized finance.[49] For all these reasons, then, innovation in the industries most important to Europe's growth in the 1950s and 1960s was facilitated by the institutions the continent had in place.

In contrast, new industries like computers, semiconductors, software and biotechnology were characterized by loose coupling, complex interactions, and high uncertainty. Loose coupling encourages innovations with the capacity to radically transform a part of the production process while leaving the rest unchanged. Complexity means that innovation depends on trial-and-error learning. And high uncertainty means that the risks associated with innovation have to be compensated for with high returns. In this environment, the institutions most conducive to technical change are decentralized structures that facilitate the exchange of information by blending cooperation with competition. Technical progress depends less on high levels of capital formation than on the creation of an environment conducive to loosely-coupled innovative activities, among the elements of which will be high-

[49]See Soskice (1996). To underscore the message of an earlier footnote, it is important to note that the way these ideas are applied here differs significantly from the way Soskice himself develops the argument.

powered financial incentives. This is hardly the sort of innovation that would have been facilitated by the relatively centralized institutional structures in place in Europe after World War II.

The implication is that productivity could rise quickly for several decades after World War II because Europe's institutions were well suited to the kind of global, incremental, capital-using adaptations needed for technical progress in industries like iron and steel, heavy machinery and transport equipment, but that growth decelerated once the problem became to develop complex, radical innovations. Europe's economy thrived in the era of the steel mill, in other words, but stumbled in the age of the microchip.[50]

C. The Institutional Foundations of R&D

Nelson and Wright (1992) posit a second foundation for American technological leadership in the post-WWII period along with the country's lead in the development of scientific-management-based mass-production manufacturing. This was America's large investment in research and development. In the 1950s and 1960s, the share of American

---

[50]This view must be reconciled with Europe's revealed comparative advantage in sectors producing high quality consumer goods and speciality inputs, the so-called "flexibly specialized" industries of Piore and Sabel (1984). It is not necessary to deny the continent's success in these sectors or to shoe-horn them into one of the two technological categories described above, for their case would appear to be captured by a third type of technological system, characterized by loose coupling, linear technology and low uncertainty, also identified by Perrow. In this type of system, change can be incremental because coupling is loose, but wage compression poses no particular barrier to innovation because uncertainty is low. Thus, there is no reason why a significant fringe of flexibly-specialized producers could not coexist throughout the period along side Europe's more capital-intensive, large-enterprise-based heavy industries.

workers engaged in R&D and with scientific or engineering credentials was double or triple British, German and French levels.[51] The U.S. dominated trade in high-technology products throughout the period.[52] Again, this is not just the historian's imputation. European leaders betrayed considerable concern over America's lead in computers and semiconductors. The OECD published a series of studies on Europe's R&D gap.

America's heavy investment in R&D reflected the contributions of both the public and private sectors. Public-sector spending was stimulated by the Cold War, notably the Sputnik shock. By 1963 the fraction of business R&D financed by direct government funds was 70 per cent higher in the U.S. than the U.K., and the gap vis-à-vis Continental Europe was even larger.[53] Funding for the National Science Foundation, the National Institutes of Health, the Department of Defense, and the Atomic Energy Commission encouraged universities to increase their capacity to supply scientists and engineers. Subsidies for education (through, inter alia, the G.I. Bill), together with high per capita incomes and a relatively even income distribution, encouraged individuals to invest in secondary and post-secondary education to an extent that significantly exceeded the levels reached in Europe.

But a key foundation of America's comparative advantage in R&D was that the country possessed institutions conducive to the activity. It inherited from the 19th century a

---

[51]Expenditure on R&D as a percentage of GDP may have differed by less across countries but was still significantly higher in the United States.

[52]Verspagen (1996) provides a number of additional R&D indicators for the period.

[53]Verspagen (1996), Table 5.3.

system of land grant universities designed to provide practical scientific education.[54] Already at the turn of the century U.S. university students per 1,000 primary students was two to three times European levels. Professionally-managed American enterprises, following the lead of General Electric, DuPont, AT&T and Kodak, were early to establish their own in-house research laboratories. When the time came to expand the supply of engineers and scientists, the U.S. had the capacity in place, and when it came time to place them with large firms, the latter already possessed the in-house research infrastructure needed to put them to work.

Europe's institutes of technical training were better adapted to incremental changes in machinery design and machine building than to the development of radical new technologies. Freeman (1997) traces the Northern European constellation of R&D-related institutions back to the 19th century. For example, under the influence of Friedrich List, the Prussian government set up training institutes to produce skilled craftsmen, subsidized the dissemination of technical advice and assistance, and rebated duties on imports of machinery. It sought to promote a cooperative, corporatist attitude on the part of employers toward the training of their workers. Again, the point is that this constellation of institutions, which encouraged incremental, global innovation rather than radical, localized advances, had roots deep in European history.

The absence of U.S.-style institutions did not prevent Europe from building up its R&D capacity after World War II. By the 1970s European countries had gone a considerable way toward closing the gap in terms of R&D spending vis-a-vis the United States. Rather, the

---

[54]Land grant universities were coupled with cooperative agricultural extensive services, whose staff were encouraged to provide practical knowledge of scientific advances in such fields as soil, chemistry, plant biology, and animal husbandry.

point is that this particular constellation of institutions gave the U.S. a head start. It contributed to the gap that existed after the war in labor and total-factor-productivity, particularly in mass-production, scientific-management-based industries. It heightened America's comparative advantage in the new "high-tech" industries of the second post-WWII quarter century, although it took some time, until the 1990s in fact, for this last advantage to manifest itself in improving U.S. competitiveness.

This section is necessarily more speculative than its predecessors, since internationally comparable estimates of R&D expenditures have only become available in recent years. Table 13 reports some exploratory regressions of the importance of various types of R&D for labor productivity. These regressions are necessarily exploratory because the sample is small (concentrating on the latter part of the 1970s and the 1980s). Nonetheless, the importance of R&D spending comes through clearly, whether measured as total R&D or R&D in non-electrical machinery. By implication, it reinforces the weight we attach to the institutional framework for innovation.

6. A Perspective on the Acceleration and Slowdown

This paper has sought to shed light on the economics of Europe's post-World War II "golden age." It has offered new measures, new tests, and new stories designed to flesh out the role of institutions in the postwar growth process.

The argument is that the institutional arrangements Europe inherited from its prior history were particularly well-suited to the macroeconomic and technological imperatives of economic growth following World War II. Corporatist labor relations encouraged the wage

moderation and high levels of investment needed to reproduce American-style industrial production on a massive scale. The fact that Europe lacked the institutions to develop an R&D capacity comparable to America's was of relatively little moment so long as the problem was to exploit existing technologies as much as it was to develop new ones. In fact, European countries' relatively centralized institutions were well suited to the incremental technical changes needed to adapt American technologies to European circumstances. And the institutions of European and global integration went some way toward creating the mass market in consumer goods and the open market in raw materials needed to support the transplantation of American technologies.

Any satisfactory explanation for the post-World War II acceleration in European growth must have implicit in it an explanation for the post-1971 slowdown. The perspective developed here suggests the following account. Europe's institutions were particularly well suited to an environment in which there existed a backlog of known technologies. Although that backlog was extensive in the wake of World War II, Europe's very success in exploiting it undermined the basis for the golden age. By the 1970s that backlog had been exhausted, and the problem became to undertake more radical innovation. At this point, Europe's institutional inheritance of centralized structures, wage compression and bank rather than securitized finance became more a handicap rather than an advantage. Some countries, most notably France, attempted to compensate with heavy government investment in high technology but with incomplete success.

One can argue further that the depletion of Europe's opportunities for catch-up growth itself undermined the bargain between capital and labor in which wage moderation

was traded for high investment. The argument, as developed in Eichengreen (1996), goes like this. While workers and capitalists are both best off if they agree to defer current consumption in return for future gains which take the form of additional investment that results in higher productivity and incomes for all concerned, neither is willing to agree to defer without an assurance that the other will do the same. This is the problem that corporatist institutions are designed to solve. But assume now a decline in the rate of return on deferring current consumption because, for example, of a fall in the return on investment and in the underlying rate of productivity growth. The incentive to resist the temptation to renege is correspondingly reduced, and institutions that were adequate to contain this temptation previously may no longer suffice. The exhaustion of the technological backlog and the end of the catch-up phase of Europe's growth could have played this role by reducing the return on investment and weakening the inventive for capital and labor to adhere to their agreement to defer current consumption in return for what were now more meager future gains. The hot summer of 1968 and the wage explosion that followed had many causes, to be sure, but this perspective suggests that the internal dynamics of the catch-up process were at least one of them.

References

Abramovitz, Moses (1986), “Catching, Up Forging Ahead, and Falling Behind,” *Journal of Economic History* 46, pp. 385-406.

Aitken, Norman D. (1973), "The Effect of the EEC and EFTA on European Trade: A Temporal Cross-Section Analysis," *American Economic Review* LXIII, pp. 881-92.

Barro, Robert J. (1991), "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics* CVI, pp. 407-43.

Boyer, Robert and Jacques Mistral (1992), *Accumulation, Inflation, Crises*, Paris: PUF.

Bruno, Michael and Jeffrey Sachs (1985), *The Economics of Worldwide Stagflation*, Cambridge: Harvard University Press.

Calmfors, Lars and John Driffill (1988), "Centralization of Wage Bargaining and Economic Performance," *Economic Policy* 6, pp. 13-61.

Clark, Peter (1979), "Investment in the 1970s: Theory, Performance and Prediction," *Brookings Papers on Economic Activity* 1, pp. 73-113.

Crafts, N.F.R. (1992), "Institutions and Economic Growth: Recent British Experience in an International Context," *Western European Politics* 15, pp. 16-38.

Crafts, N.F.R. and Gianni Toniolo (1996), *Economic Growth in Europe Since 1945*, Cambridge: Cambridge University Press.

Crouch, Colin (1993), *Industrial Relations and European State Traditions* Oxford: Clarendon Press.

Crouch, Colin (1985), "The Conditions for Trade Union Restraint," in L. Lindberg and C. Maier (eds), *The Politics of Inflation and Economic Stagnation*, Washington, D.C.: The Brookings Institution, pp. 103-39.

De Grauwe, Paul (1988), "Exchange Rate Variability and the Slowdown in the Growth of International Trade," *Staff Papers* 35, pp. 63-84.

Denison, Edward (1967), *Why Growth Rates Differ*, Washington, D.C.: The Brookings Institution.

Dumke, Rolf (1997), “Reappraising the Post-War Economic System in Germany: Is the Social Market Economy Passe?” unpublished manuscript, IFO Institute.

Edwards, Sebastian (1998), “Openness, Productivity and Growth: What Do We Really Know?” *Economic Journal* 108, p. 383-98.

Eichengreen, Barry (1993), *Reconstructing Europe’s Trade and Payments: The European Payments Union*, Manchester and Ann Arbor: Manchester University Press and University of Michigan Press.

Eichengreen, Barry (1994), "Institutional Prerequisites for Economic Growth: Europe After World War II," *European Economic Review,* 38, pp. 883-90.

Eichengreen, Barry (1996), “Institutions and Economic Growth: Europe Since World War II,” in N.F.R. Crafts and Gianni Toniolo (eds), *Economic Growth in Europe Since 1945*, Cambridge: Cambridge University Press, pp. 38-72.

Eichengreen, Barry (1998), “Innovation and Integration: Europe’s Economy Since 1945,” in Mary Fulbrook (ed.), *The Short Oxford History of Europe in the 20th Century*, Oxford: Oxford University Press (forthcoming).

Europa Publications (various years), *Europa World Yearbook*, London: Europa Publications.

Frankel, Jeffrey (1992), "Is a Yen Bloc Forming in Pacific Asia?" in Richard O’Brien (ed.), *Finance and the International Economy*, Oxford: Oxford University Press.

Freeman, Christopher (1997), "The National System of Innovation in Historical Perspective," in Daniele Archibugi and Jonathan Michie (eds), *Technology, Globalization and Economic Performance*, Cambridge: Cambridge University Press, pp.24-49.

Grier, Kevin, B. (1993), "Governments, Unions and Economic Growth," unpublished manuscript: George Mason University.

Grout, P.A. (1984), "Investment and Wages in the Absence of Binding Contracts: A Nash Bargaining Approach," *Econometrica* 52, pp. 449-60.

Hargreaves Heap, Shaun P. (1994), "Institutions and (Short-Run) Macroeconomic Performance," *Journal of Economic Surveys* 8, pp. 35-56.

Harrison, J. (1993), *The Spanish Economy: From the Civil War to the European Community*, London: Macmilllan.

Hayward, J.E.S. (1966), "Interest Groups and Incomes Policy in France," British Journal of Industrial Relations 4, pp. 165-200.

Hendrekson, Magnus, Johan Torstensson and Rasha Torstensson (1997), “Growth Effects of European Integration,” *European Economic Review* 41, pp. 1537-557.

Hoel, K. (1990), "Local Versus Central Wage Bargaining with Endogenous Investments," *Scandinavian Journal of Economics* 92, pp. 453-69.

Johnson, George and Frank Stafford (1998), “Technology Regimes and the Distribution of Real Wages,” unpublished manuscript.

Kashyap, Anil K., Jeremy C. Stein and David W. Wilcox (1993), "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance," *American Economic Review* 83, pp. 78-98.

Kindleberger, Charles P. (1967), *Europe’s Postwar Growth*, New York: Oxford University Press.

Kitschelt, Herbert (1991), “Industrial Governance Structures, Innovation Strategies, and the Case of Japan: Sectoral or Cross-National Comparative Analysis?” *International Organization* 45, pp. 453-93.

Knack, Stephen, and Philip Keefer (1996), “Institutions and the Convergence Hypothesis: The Cross National Evidence,” *Public Choice* 87, pp. 207-28.

Knack, Stephen and Philip Keefer (1995), “Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures,” *Economics and Politics* 7, pp. 207-28.

Kogut, Bruce (1992), “National Organizing Principles of Work, and the Erstwhile Dominance of the American Multinational Corporation,” *Industrial and Corporate Change* **, pp. 285-326.

Lamfallusy, Alexander (1963), *The European Union and the Six*, Homewood, Ill.: Irwin.

Lancaster, Kelvin (1973), "The Dynamic Inefficiency of Capitalism," *Journal of Political Economy* 81, pp. 1092-110.

Landesmann, Michael and Juhana Vartiainen (1993), "Social Corporatism and Long-Term Economic Performance," in Jukka Pekkarinen, Matti Pohjola and Bob Rowthorn (eds), *Social Corporatism*, Oxford: Oxford University Press, pp. 210-42.

La Porta, Raphael, Florencio Lopez-de-Silanes, Andre Schleifer and Robert Vishny (1997), "Legal Determinants of External Finance," *Journal of Finance* 52, pp. 1131-150.

Levine, Ross and Sara Zervos (1994), "What We Know About Policy and Growth From Cross-Country Analysis," in Luigi Pasinetti and Robert Solow (eds), *Economic Growth and the Structure of Long-Term Development*, New York: St. Martin's Press, pp. 22-44.

Maddison, Angus (1996), "Macroeconomic Accounts for European Countries," in Bart van Ark and Nicholas Crafts (eds), *Quantitative Aspects of Post-War European Economic Growth*, Cambridge: Cambridge University Press, pp. 27-83.

Motley, Brian (1994), "Growth and Inflation: A Cross-Country Study," unpublished manuscript, Federal Reserve Bank of San Francisco.

Nelson, Richard (1993), *National Innovation Systems*, New York: Oxford University Press.

Nelson, Richard and Gavin Wright (1992), "Rise and Fall of American Technological Leadership: The Postwar Era in Historical Perspective," *Journal of Economic Literature* 30, pp. 1931-964.

North, Douglass C. (1993), "Institutions and Credible Commitment," *Journal of Institutional and Theoretical Economics* 149, pp. 11-23.

North, Douglass C. and Barry Weingast (1989), "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth Century England," *Journal of Economic History* 49, pp. 803-32.

Perrow, Charles (1984), *Normal Catastrophes*, New York: Basic Books.

Perrow, Charles (1986), *Complex Organizations*, New York: Random House, 3rd edition.

Piore, Michael and Charles Sabel (1984), *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.

Przeworski, Adam and Michael Wallerstein (1982), "The Structure of Class Conflict in Democratic Societies," *American Political Science Review* 76, pp. 215-38.

Rokkan, S. and J. Meyriat (1969), *International Guide to Electoral Statistics, Volume 1: National Elections in Western Europe*, Paris: Moulton.

Soskice, David (1996), "German Technology Policy, Innovation, and National Institutional Frameworks," WZB Discussion Paper 96-319.

Taylor, Charles L. and Michael C. Hudson (1983), *World Handbook of Political and Social Indicators*, New Haven: Yale University Press.

United States Department of State (various years), *World Strength of Communist Parties*, Washington, D.C.: Government Printing Office.

van der Ploeg, Frederick (1987), "Trade Unions, Investment and Employment: A Non-Cooperative Approach," *European Economic Review* 31, pp. 1465-492.

Verspagen, Bart (1996), "Technology Indicators and Economic Growth in the European Area: Some Empirical Evidence," in Bart van Ark and Nicholas Crafts (eds), *Quantitative Aspects of Post-War European Economic Growth*, Cambridge: Cambridge University Press, pp. 215-43.

Wolf, Holger (1995), "Postwar Germany in the European Context: Domestic and International Sources of Growth," in Barry Eichengreen (ed.), *Europe's Postwar Recovery*, Cambridge: Cambridge University Press, pp. 323-52.

Wright, Gavin (1990), "The Origins of American Industrial Success, 1879-1940," *American Economic Review* 80, pp. 651-68.

Table 1. Phases of Growth, 1820-1992
(annual average compound growth rate)

	1820-70	1870-1913	1913-50	1950-73	1973-92	1820-1992
			GDP			
Western Europe	1.7	2.1	1.4	4.7	2.2	2.2
Southern Europe	1.0	1.5	1.3	6.3	3.1	2.1
Eastern Europe	1.6	2.4	1.6	4.7	-0.4	2.0
World	1.0	2.1	1.9	4.9	3.0	2.2
			GDP per capita			
Western Europe	1.0	1.3	0.9	3.9	1.8	1.5
Southern Europe	0.6	1.1	0.4	4.9	1.7	1.4
Eastern Europe	0.7	1.0	1.2	3.5	1.1	1.1
World	1.3	1.3	0.9	2.9	1.2	1.2

Source: Maddison (1995).

Table 2. Per Capita Real GDP Growth in 56 Countries, 1820-1992
(annual average compound growth rates)

	1820-70	1870-1913	1913-50	1950-73	1973-92
12 Western European Countries					
Austria	0.7	1.5	0.2	4.9	2.2
Belgium	1.4	1.0	0.7	3.5	1.9
Denmark	0.9	1.6	1.6	3.1	1.6
Finland	0.8	1.4	1.9	4.3	1.6
France	0.8	1.5	1.1	4.0	1.7
Germany	1.1	1.6	0.3	5.0	2.1
Italy	0.6	1.3	0.8	5.0	2.4
Netherlands	1.1	0.9	1.1	3.4	1.4
Norway	0.5	1.3	2.1	3.2	2.9
Sweden	0.7	1.5	2.1	3.1	1.2
Switzerland	n.a.	1.5	2.1	3.1	0.8
United Kingdom	1.2	1.0	0.8	2.5	1.4
Arithmetic average	0.9	1.3	1.2	3.8	1.8
5 South European Countries					
Greece	n.a.	n.a.	0.5	6.2	1.5
Ireland	1.2	1.0	0.7	3.1	2.7
Portugal	n.a.	0.5	1.2	5.7	2.1
Spain	0.5	1.2	0.2	5.8	1.9
Turkey	n.a.	n.a.	0.8	3.3	2.6
Arithmetic average	n.a.	0.9	0.7	4.8	2.2
7 Eastern European Countries					
Bulgaria	n.a.	n.a.	0.3	5.2	-1.4
Czechoslovakia	0.6	1.4	1.4	3.1	-0.1
Hungary	n.a.	1.2	0.5	3.6	0.0
Poland	n.a.	n.a.	n.a.	3.4	-0.6
Romania	n.a.	n.a.	n.a.	4.8	-1.6
USSR	0.6	0.9	1.8	3.4	-0.4
Yugoslavia	n.a.	n.a.	1.0	4.4	-0.5
Arithmetic average	n.a.	1.2	1.0	4.0	-0.8

Source: Maddison (1995).

Table 3. The Contribution to Growth of Gross Domestic Product in Nine Western European Countries of Labor, Capital, and Technical Progress, 1949-59

Country	Labor Force	Capital Stock	GDP Trend	Estimated Contribution to Growth of GDP of:			ICOR
	Compound annual percentage rate of growth			Labor	Capital	Technical progress	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Western Germany[1]	1.6	6.0	7.4	1.1	1.8	4.5	2.6
Italy	1.1	3.2	5.9	0.8	1.0	4.1	2.1
Yugoslavia	1.1	4.9	5.5	0.8	1.5	3.2	2.5
Netherlands	1.2	4.8	4.8	0.8	1.4	2.6	4.0
France	0.1	3.4	4.5	0.1	1.0	3.4	2.9
	0.3	4.6	3.4	0.2	1.4	1.8	8.5
Norway	0.5	2.0	3.4	0.3	0.6	2.5	4.1
Sweden	0.3	2.6	3.0	0.2	0.8	2.0	2.8
Belgium	0.6	3.1	2.4	0.4	0.9	1.1	3.7
United Kingdom							

Source: Extract from United Nations (1964).

[1]1950-59.

Table 4. Growth of Real GDP and its Components
1960-69

	Annual Percentage Rate of Growth			Estimated contribution to growth of GDP by:		
	Labour Force	Capital Stock3	Real GDP	Labour	Capital	Technical Progress
GRC	-0.9	6.6	6.8	-0.7	2.0	5.5
ITL2	-0.3	5.3	5.6	-0.2	1.6	4.2
FRA	0.8	5.4	5.3	0.6	1.6	3.2
BEL1	0.3	5.2	4.7	0.2	1.6	3.0
GER	0.4	6.0	4.7	0.3	1.8	2.6
SWE1	0.5	4.1	4.3	0.3	1.2	2.8
NOR1	1.0	3.9	4.1	0.7	1.2	2.2
FIN1	0.2	4.9	4.0	0.1	1.5	2.4
GBR	0.3	4.4	3.1	0.2	1.3	1.6

Sources : OECD Economic Outlook database; Flows and Stocks of Fixed Capital, OECD;
World Economic Outlook, IMF

Notes on Capital Stock
1. Belgium, Finland, Norway, Sweden : average over 1963-69.
2. Italy: average over 1961-69.
3. Net total capital stock at constant prices for all countries except Sweden (gross total capital stock at constant prices).

Note: growth rates calculated as the difference of the log of the levels.

Note on Estimated contributions to growth of GDP:
1. Contribution by Labour = 0.7 * Average annual growth rate of the labour force
2. Contribution by Capital = 0.3 * Average annual growth rate of the capital stock
3. Contribution by Technical Progress is calculated as a residual

Table 1. Phases of Growth, 1820-1992
(annual average compound growth rate)

	1820-70	1870-1913	1913-50	1950-73	1973-92	1820-1992
	GDP					
Western Europe	1.7	2.1	1.4	4.7	2.2	2.2
Southern Europe	1.0	1.5	1.3	6.3	3.1	2.1
Eastern Europe	1.6	2.4	1.6	4.7	-0.4	2.0
World	1.0	2.1	1.9	4.9	3.0	2.2
	GDP per capita					
Western Europe	1.0	1.3	0.9	3.9	1.8	1.5
Southern Europe	0.6	1.1	0.4	4.9	1.7	1.4
Eastern Europe	0.7	1.0	1.2	3.5	1.1	1.1
World	1.3	1.3	0.9	2.9	1.2	1.2

Source: Maddison (1995).

Table 2. Per Capita Real GDP Growth in 56 Countries, 1820-1992
(annual average compound growth rates)

	1820-70	1870-1913	1913-50	1950-73	1973-92
12 Western European Countries					
Austria	0.7	1.5	0.2	4.9	2.2
Belgium	1.4	1.0	0.7	3.5	1.9
Denmark	0.9	1.6	1.6	3.1	1.6
Finland	0.8	1.4	1.9	4.3	1.6
France	0.8	1.5	1.1	4.0	1.7
Germany	1.1	1.6	0.3	5.0	2.1
Italy	0.6	1.3	0.8	5.0	2.4
Netherlands	1.1	0.9	1.1	3.4	1.4
Norway	0.5	1.3	2.1	3.2	2.9
Sweden	0.7	1.5	2.1	3.1	1.2
Switzerland	n.a.	1.5	2.1	3.1	0.8
United Kingdom	1.2	1.0	0.8	2.5	1.4
Arithmetic average	0.9	1.3	1.2	3.8	1.8
5 South European Countries					
Greece	n.a.	n.a.	0.5	6.2	1.5
Ireland	1.2	1.0	0.7	3.1	2.7
Portugal	n.a.	0.5	1.2	5.7	2.1
Spain	0.5	1.2	0.2	5.8	1.9
Turkey	n.a.	n.a.	0.8	3.3	2.6
Arithmetic average	n.a.	0.9	0.7	4.8	2.2
7 Eastern European Countries					
Bulgaria	n.a.	n.a.	0.3	5.2	-1.4
Czechoslovakia	0.6	1.4	1.4	3.1	-0.1
Hungary	n.a.	1.2	0.5	3.6	0.0
Poland	n.a.	n.a.	n.a.	3.4	-0.6
Romania	n.a.	n.a.	n.a.	4.8	-1.6
USSR	0.6	0.9	1.8	3.4	-0.4
Yugoslavia	n.a.	n.a.	1.0	4.4	-0.5
Arithmetic average	n.a.	1.2	1.0	4.0	-0.8

Source: Maddison (1995).

Table 3. The Contribution to Growth of Gross Domestic Product in Nine Western European Countries of Labor, Capital, and Technical Progress, 1949-59

	Labor Force	Capital Stock	GDP Trend	Estimated Contribution to Growth of GDP of:			
	Compound annual percentage rate of growth			Labor	Capital	Technical progress	ICOR
Country	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Western Germany[1]	1.6	6.0	7.4	1.1	1.8	4.5	2.6
Italy	1.1	3.2	5.9	0.8	1.0	4.1	2.1
Yugoslavia	1.1	4.9	5.5	0.8	1.5	3.2	2.5
Netherlands	1.2	4.8	4.8	0.8	1.4	2.6	4.0
France	0.1	3.4	4.5	0.1	1.0	3.4	2.9
	0.3	4.6	3.4	0.2	1.4	1.8	8.5
Norway	0.5	2.0	3.4	0.3	0.6	2.5	4.1
Sweden	0.3	2.6	3.0	0.2	0.8	2.0	2.8
Belgium	0.6	3.1	2.4	0.4	0.9	1.1	3.7
United Kingdom							

Source: Extract from United Nations (1964).
[1]1950-59.

Table 4. Growth of Real GDP and its Components
1960-69

	Annual Percentage Rate of Growth			Estimated contribution to growth of GDP by:		
	Labour Force	Capital Stock3	Real GDP	Labour	Capital	Technical Progress
GRC	-0.9	6.6	6.8	-0.7	2.0	5.5
ITL2	-0.3	5.3	5.6	-0.2	1.6	4.2
FRA	0.8	5.4	5.3	0.6	1.6	3.2
BEL1	0.3	5.2	4.7	0.2	1.6	3.0
GER	0.4	6.0	4.7	0.3	1.8	2.6
SWE1	0.5	4.1	4.3	0.3	1.2	2.8
NOR1	1.0	3.9	4.1	0.7	1.2	2.2
FIN1	0.2	4.9	4.0	0.1	1.5	2.4
GBR	0.3	4.4	3.1	0.2	1.3	1.6

Sources : OECD Economic Outlook database; Flows and Stocks of Fixed Capital, OECD;
World Economic Outlook, IMF

Notes on Capital Stock
1. Belgium, Finland, Norway, Sweden : average over 1963-69.
2. Italy: average over 1961-69.
3. Net total capital stock at constant prices for all countries except Sweden (gross total capital stock at constant prices).

Note: growth rates calculated as the difference of the log of the levels.

Note on Estimated contributions to growth of GDP:
1. Contribution by Labour = 0.7 * Average annual growth rate of the labour force
2. Contribution by Capital = 0.3 * Average annual growth rate of the capital stock
3. Contribution by Technical Progress is calculated as a residual

TABLE 5: Determinants of GDP Growth
1950-1988

	EQ1	EQ2	EQ3	EQ4	EQ5
Constant	**3.17**	**1.21**	**0.88**	**1.15**	**0.51**
	(5.61)	(1.35)	(0.80)	(1.06)	(0.57)
Population Growth	0.74	0.62	0.75	0.76	0.94
	(4.32)	(2.96)	(3.12)	(3.22)	(4.07)
GDP per cápita	-0.28	-0.34	-0.25	-0.22	-0.28
	(6.26)	(6.65)	(3.25)	(3.58)	(4.32)
Average Investment/GDP	0.10	0.20			
	(5.63)	(6.17)			
Inflation Variability	-0.07	-0.09	-0.10	-0.09	-0.16
	(2.39)	(2.62)	(3.02)	(2.59)	(3.03)
Growth Gov. Cons./GDP	-0.44	-0.45	-0.09	-0.03	-0.26
	(7.17)	(7.22)	(0.99)	(0.33)	(2.49)
Inflation	-0.03	-0.08	-0.05	-0.03	-0.09
	(1.03)	(1.80)	(1.09)	(0.83)	(1.66)
Investment Growth			0.53	0.50	0.41
			(6.65)	(6.26)	(5.16)
Initial Investment/GDP			0.08	0.05	0.12
			(1.85)	(1.09)	(2.75)
Export Growth			0.17	0.13	-0.02
			(2.56)	(1.67)	(0.26)
Growth of intra-EEC Trade				0.07	
				(1.15)	
Growth of Intra-Europe Trade					0.14
					(2.48)
N	192	168	168	168	168
R2	0.67	0.65	0.64	0.66	0.66
Se	1.12	1.22	1.35	1.33	1.35

TABLE 6. Determinants of GDP growth
1950-70 and 1971-1988

	EQ1		EQ2		EQ3		EQ4		EQ5	
	1950-70	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**
Constant	4.55	2.49	4.13	0.95	2.38	3.97	2.09	3.14	2.48	2.25
	(6.14)	(2.54)	(4.29)	(0.86)	(2.06)	(3.01)	(1.60)	(2.41)	(2.40)	(1.29)
Population Growth	1.19	0.79	1.34	0.59	1.48	0.21	1.48	0.20	1.67	0.48
	(4.41)	(3.71)	(4.31)	(2.14)	(5.70)	(0.75)	(5.73)	(0.70)	(5.85)	(1.42)
GDP per cápita	-0.52	-0.20	-0.64	-0.28	-0.48	-0.30	-0.47	-0.25	-0.53	-0.28
	(7.77)	(3.45)	(8.24)	(4.58)	(4.75)	(3.71)	(4.51)	(3.55)	(5.59)	(3.83)
Average Investment/GDP	0.09	0.10	0.13	0.19						
	(3.96)	(4.92)	(3.95)	(5.50)						
Inflation Variability	-0.16	-0.07	-0.19	-0.10	-0.22	-0.05	-0.21	-0.08	-0.29	-0.12
	(2.94)	(1.89)	(3.36)	(2.18)	(3.88)	(1.39)	(3.65)	(1.99)	(4.51)	(1.83)
Growth Gov. Cons./GDP	-0.37	-0.44	-0.34	-0.51	-0.04	-0.33	-0.04	-0.32	-0.20	-0.37
	(5.77)	(4.21)	(5.41)	(4.88)	(0.55)	(3.03)	(0.51)	(3.04)	(2.52)	(3.00)
Inflation	-0.16	-0.01	-0.18	0.04	-0.14	-0.10	-0.15	-0.07	-0.15	-0.12
	(2.01)	(0.31)	(2.24)	(0.86)	(1.38)	(1.74)	(1.41)	(1.37)	(1.65)	(1.97)
Initial Investment					0.06	0.14	0.07	0.12	0.08	0.14
					(1.90)	(3.11)	(1.87)	(2.71)	(2.14)	(2.97)
Investment Growth					0.30	0.41	0.32	0.37	0.24	0.34
					(3.47)	(6.60)	(3.44)	(5.73)	(3.48)	(4.26)
Export Growth					0.20	-0.05	0.18	-0.05	0.06	-0.15
					(3.84)	(0.50)	(2.40)	(0.49)	(1.09)	(1.27)
Growth of intra-EEC Exports							0.02	0.05		
							(0.56)	(1.61)		
Growth of Intra-Europe Trade									0.10	0.13
									(2.27)	(1.53)
N	84	84	84	84	84	84	84	84	84	84
R2	0.62	0.50	0.65	0.55	0.70	0.59	0.70	0.63	0.72	0.57
Se	1.16	1.02	1.19	1.11	1.16	1.09	1.16	1.02	1.15	1.18

TABLE 7. Determinants of Constant Export Growth
1950-1988

	EQ1	EQ2	EQ3	EQ4	EQ5	EQ6
	2.32	**0.50**	**2.16**	**-1.85**	**1.05**	**1.18**
	(1.79)	(0.22)	(1.77)	(0.84)	(0.48)	(0.92)
GDP Growth	1.07	1.14	1.00	1.13	1.10	0.99
	(4.57)	(4.62)	(3.39)	(4.33)	(5.09)	(3.89)
Inflation	-0.25	-0.26	-0.24	-0.21	-0.22	-0.24
	(1.80)	(1.91)	(1.75)	(1.59)	(1.72)	(1.72)
Inflation Variability	0.30	0.31	0.31	0.32	0.32	0.37
	(2.29)	(2.63)	(2.43)	(2.96)	(2.68)	(2.92)
ECSC/EEC	2.70		2.46	1.58	0.80	
	(3.32)		(2.88)	(1.90)	(1.59)	
EPU/CONV.		1.75				
		(0.92)				
ART. VIII			0.80			
			(0.60)			
Conv. (1958-)				-0.66	-0.77	
				(0.33)	(0.06)	
EPU (1951-57)				5.97	2.05	
				(2.73)	(0.91)	
ECSC						7.34
						(2.83)
EEC (1958 -)						0.97
						(1.16)
N	168	168	168	168	168	168
R2	0.35	0.40	0.40	0.39	0.42	0.40
Se	3.65	3.66	3.65	3.69	3.56	3.66

TABLE 8.. Determinants of Export Growth
1950-1970 and 1971-1988

	EQ1		EQ2		EQ3		EQ4		EQ5		EQ6	
	1950-70	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**
Constant	-0.96	6.30	-4.74	6.30	-1.15	4.51	-4.78	6.30	-4.04	5.25	-1.19	6.30
	(0.49)	(2.51)	(1.36)	(2.51)	(0.58)	(3.00)	(1.41)	(2.51)	(1.51)	(2.34)	(0.58)	(2.51)
GDP Growth	1.27	-0.49	1.49	0.49	1.17	0.50	1.47	0.49	1.50	0.50	1.25	-0.49
	(3.93)	(2.22)	(4.35)	(2.22)	(3.10)	(2.42)	(4.17)	(2.22)	(4.77)	(2.30)	(3.82)	(2.22)
Inflation	0.07	-0.18	0.17	-0.18	0.15	-0.19	0.18	-0.18	0.13	-0.19	0.10	-0.18
	(0.19)	(1.45)	(0.43)	(1.45)	(0.41)	(1.72)	(0.46)	(1.45)	(0.38)	(1.50)	(0.25)	(1.45)
Inflation Variability	0.68	-0.05	0.76	0.20	0.73	-0.20	0.75	0.20	0.70	0.19	0.70	-0.05
	(3.01)	(2.87)	(3.42)	(1.87)	(3.11)	(1.58)	(3.39)	(1.87)	(3.38)	(1.73)	(2.96)	(2.87)
ECSC/EEC	4.08	-0.39	3.29	-0.39	3.95	-0.14	3.18	-0.39	1.92	-0.07		
	(3.36)	(0.56)	(2.74)	(0.56)	(3.38)	(0.20)	(2.64)	(0.56)	(2.28)	(0.13)		
EPU/CONV.			3.17	-2.22								
			(1.39)	(1.02)								
ART. VIII					0.07	-0.33						
					(0.83)	(0.30)						
Conv. (1958-)							2.32	-2.22	2.60	-1.13		
							(0.87)	(1.02)	(1.43)	(0.59)		
EPU (1951-57)							3.62		3.08			
							(1.65)		(1.51)			
ECSC											4.80	
											(2.40)	
EEC (1958 -)											3.40	-0.39
											(2.28)	(0.56)
N	84	84	84	84	84	84	84	84	84	84	84	84
R2	0.41	0.27	0.42	0.27	0.41	0.26	0.44	0.27	0.27	0.27	0.42	0.27
Se	4.08	2.81	4.08	2.81	4.11	2.82	4.03	2.81	2.79	2.80	4.08	2.81

TABLE 9. Determinants of Investment growth
1950-1988

	EQ1	EQ2	EQ3	EQ4
Constant	**1.67**	**1.88**	**3.26**	**3.53**
	(2.61)	(2.41)	(3.45)	(3.54)
GDP per cápita	-0.93	-0.10	-0.23	-0.24
	(1.06)	(1.08)	(2.18)	(2.35)
Growth Gov. Cons./GDP	-0.38	-0.38	-0.34	-0.33
	(3.05)	(3.04)	(2.70)	(2.69)
Growth of Labors's share	-0.48	-0.48	-0.47	-0.44
	(3.89)	(3.93)	(3.91)	(3.57)
Growth of Corporate tax rate	-13.93	-14.02	14.31	14.39
	(3.77)	(3.77)	(3.81)	(3.91)
Growth Tobin´s q	5.05	5.02	4.81	4.70
	(2.37)	(2.38)	(2.32)	(2.26)
Inflation	0.06	0.06	0.04	0.04
	(1.10)	(1.08)	(0.69)	(0.70)
Political Instability		-0.25	-0.22	-0.26
		(0.56)	(0.51)	(0.59)
Real Interest Rate		1.97	-0.15	-0.14
		(2.15)	(2.22)	(2.09)
Variability of Labor's cost				-0.20
				(0.84)
N	155	155	155	155
R2	0.51	0.51	0.51	0.52
Se	2.13	2.14	2.16	2.16

TABLE 10: Determinants of investment growth
1950-1970 and 1971-1988

	EQ1		EQ2		EQ3		EQ4	
	1950-70	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**
Constant	**3.28**	**0.21**	**4.38**	**-0.39**	**4.24**	**2.15**	**4.99**	**2.67**
	(3.76)	(0.12)	(4.13)	(0.22)	(3.41)	(0.98)	(3.75)	(1.13)
GDP per cápita	-0.18	-0.80	-0.22	-0.78	-0.21	-0.20	-0.25	-0.25
	(1.35)	(0.56)	(1.63)	(0.54)	(1.49)	(0.46)	(1.84)	(0.43)
Growth Gov. Cons./GDP	-0.26	-0.18	-0.50	-0.23	-0.50	-0.15	-0.49	-0.14
	(4.43)	(0.57)	(4.71)	(0.72)	(4.72)	(0.46)	(4.62)	(0.43)
Growth of Labors's share	-0.81	-0.53	-0.86	-0.52	-0.86	-0.52	-0.64	-0.55
	(3.94)	(2.62)	(4.57)	(2.60)	(4.60)	(2.63)	(4.71)	(2.66)
Growth of Corporate tax rate	-4.51	-21.4	-4.92	-21.4	-4.90	-21.9	-6.25	-22.38
	(1.64)	(5.24)	(1.91)	(5.13)	(1.89)	(5.22)	(2.43)	(5.21)
Growth Tobin´s q	1.60	7.82	1.70	7.95	1.72	7.72	-0.12	7.62
	(0.40)	(3.38)	(0.48)	(3.42)	(0.48)	(3.46)	(0.03)	(3.46)
Inflation	0.08	0.04	0.04	0.03	0.04	0.01	0.06	0.01
	(0.55)	(0.67)	(0.28)	(0.65)	(0.30)	(0.26)	(0.42)	(0.17)
Political Instability			-1.16	0.89	-1.19	0.70	-1.28	0.68
			(2.67)	(1.36)	(2.59)	(1.04)	(2.78)	(0.98)
Real Interest Rate					0.02	-0.14	-0.05	-0.16
					(0.21)	(2.13)	(0.49)	(2.31)
Variability of Labor's cost							-0.66	0.07
							(1.61)	(0.29)
N	75	80	75	80	75	80	75	80
R2	0.44	0.54	0.47	0.55	0.48	0.55	0.49	0.55
Se	2.00	2.13	1.95	2.12	1.96	2.15	1.95	2.17

TABLE 11: Determinants of Wage Growth
1950-1988

	EQ1	EQ2	EQ3	EQ4	EQ5
Constant	**0.03**	**0.06**	**0.05**	**0.06**	**0.06**
	(3.69)	(3.05)	(3.19)	(5.50)	(5.07)
Growth of GDP per worker	0.93	0.60	0.01	0.01	0.01
	(3.46)	(1.85)	(3.70)	(4.36)	(4.29)
Labor Force Growth	-0.78	-0.46	-0.80	-0.48	-0.43
	(1.18)	(0.68)	(1.23)	(0.71)	(0.64)
Investment Growth	-0.76	-0.54	-0.82	-0.94	-0.94
	(2.80)	(2.00)	(2.93)	(3.47)	(3.45)
Inflation	0.16	0.37	0.20	0.26	0.26
	(1.52)	(1.47)	(1.76)	(2.39)	(2.41)
Domestic pressure	-0.55	-0.42	-0.65	-0.92	-0.92
	(2.80)	(1.44)	(3.12)	(4.28)	(4.31)
Crouch		-0.03			
		(2.57)			
Corporation Index			-0.02		0.01
			(1.87)		(0.84)
Centralization				-0.06	-0.06
				(4.94)	(4.14)
N	168	168	168	168	168
R2	0.45	0.48	0.45	0.48	0.48
Se	0.03	0.03	0.04	0.03	0.03

TABLE 12. Determinants of wage growth
1950-1970 and 1971-1988

	EQ1		EQ2		EQ3		EQ4	
	1950-70	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**
Constant	0.04	0.15	0.04	0.15	0.03	0.15	0.03	0.14
	(5.10)	(6.21)	(4.45)	(5.99)	(3.23)	(6.38)	(5.20)	(6.05)
Growth of GDP per worker	0.69	0.41	0.67	0.57	0.63	0.47	0.67	0.39
	(3.16)	(0.72)	(3.35)	(1.01)	(2.88)	(0.82)	(3.17)	(0.70)
Labor Force Growth	-0.98	-0.02	-0.01	-0.02	-0.01	-0.02	-0.97	-0.02
	(1.49)	(1.88)	(1.57)	(1.66)	(1.59)	(1.94)	(1.47)	(2.04)
Investment Growth	-0.35	-0.45	-0.31	-0.54	-0.28	-0.47	-0.34	-0.46
	(1.80)	(1.39)	(1.73)	(1.62)	(1.41)	(1.45)	(1.74)	(1.43)
Inflation	0.52	-0.61	0.49	0.12	0.47	0.21	0.53	-0.33
	(2.44)	(0.05)	(2.25)	(0.10)	(2.24)	(0.19)	(2.69)	(0.28)
Domestic pressure	-0.14	-0.01	-0.14	-0.01	-0.41	-0.01	-0.15	-0.01
	(0.70)	(3.99)	(0.65)	(4.02)	(0.21)	(3.96)	(0.83)	(3.87)
Corp. 1	-0.01	-0.02						
	(1.43)	(1.20)						
Corp. 2			-0.01	-0.50				
			(1.02)	(1.94)				
Corp. 3					-0.54	-0.03		
					(0.30)	(1.28)		
Corp. 4							-0.06	-0.07
							(2.16)	(1.48)
N	84	84	84	84	84		84	84
R2	0.40	0.50	0.40	0.51	0.39		0.41	0.50
Se	0.02	0.04	0.02	0.04	0.02		0.03	0.04

TABLE 13. Determinants of Wage Growth (II)
1950-1988

	EQ1	EQ2	EQ3	EQ4
Constant	0.05	0.05	0.05	0.04
	(3.95)	(4.05)	(3.43)	(3.73)
Growth of GDP per worker	0.01	0.01	0.01	0.01
	(3.88)	(4.04)	(3.54)	(3.82)
Labor Force Growth	-0.47	-0.35	-0.58	-0.59
	(0.66)	(0.47)	(0.84)	(0.87)
Investment Growth	-0.93	-0.97	-0.87	-0.53
	(3.20)	(3.26)	(2.92)	(1.81)
Inflation	0.23	0.23	0.23	-0.01
	(2.01)	(1.98)	(2.13)	(3.47)
Domestic pressure	-0.66	-0.77	-0.59	-0.61
	(3.09)	(3.28)	(2.87)	(3.04)
Corp.1	-0.03			
	(2.09)			
Corp.2		-0.04		
		(2.40)		
Corp.3			-0.03	
			(1.51)	
Corp.4				-0.08
				(2.58)
N	168	168	168	168
R2	0.44	0.43	0.44	0.44
Se	0.04	0.04	0.03	0.03

TABLE 14. Determinants of Wage Growth (II)
1950-1970 and 1971-1988

	EQ1		EQ2		EQ3		EQ4		EQ5	
	1950-70	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**	**1950-70**	**1971-88**
Constant	0.03	**0.14**	0.04	0.19	0.04	0.17	0.05	0.16	0.05	0.16
	(4.70)	**(6.11)**	(2.55)	(6.26)	(4.26)	(6.37)	(6.28)	(7.08)	(5.57)	(6.33)
Growth of GDP per worker	0.62	**0.39**	0.37	0.10	0.65	0.44	0.71	0.57	0.69	0.57
	(2.89)	**(0.69)**	(1.59)	(0.17)	(3.17)	(0.80)	(3.51)	(1.11)	(3.47)	(1.11)
Labor Force Growth	-0.01	**-0.02**	-0.72	-0.02	-0.01	-0.03	-0.97	-0.02	-0.91	-0.02
	(6.13)	**(2.18)**	(1.14)	(1.81)	(1.70)	(2.40)	(1.53)	(1.92)	(1.43)	(1.90)
Investment Growth	-0.26	**-0.41**	-0.50	-0.68	-0.29	-0.41	-0.37	-0.50	-0.36	-0.50
	(1.32)	**(1.31)**	(0.31)	(0.27)	(1.47)	(1.31)	(1.90)	(1.67)	(1.98)	(1.66)
Inflation	0.45	**-0.50**	0.27	0.15	0.45	-0.67	0.53	0.62	0.55	0.61
	(2.27)	**(0.44)**	(0.85)	(0.60)	(2.25)	(0.06)	(2.67)	(0.57)	(2.83)	(0.57)
Domestic pressure	-0.22	**-0.01**	0.21	-0.01	-0.61	-0.01	-0.35	-0.01	-0.38	-0.01
	(0.12)	**(3.86)**	(0.95)	(2.79)	(0.33)	(4.46)	(1.90)	(4.72)	(2.19)	(4.63)
Crouch			-0.54	-0.08						
			(0.38)	(3.59)						
Corporation Index					-0.01	-0.04			0.01	0.97
					(0.82)	(2.05)			(0.90)	(0.03)
Centralization Indez							-0.03	-0.06	-0.04	-0.06
							(3.20)	(3.43)	(3.13)	(2.84)
N	84	**84**	60	60	84	84	84	84	84	84
R2	0.39	**0.49**	0.33	0.57	0.39	0.51	0.43	0.54	0.44	0.54
Se	0.02	**0.04**	0.02	0.04	0.02	0.04	0.02	0.03	0.02	0.03

Table 15. Determinants of Labour Productivity

	EQ.1	EQ.2	EQ.3	EQ.4	EQ.5	EQ.6	EQ.7	EQ.8	EQ.9
Constant	-0.67	-0.02	-0.59	-2.40	-2.54	-2.12	-0.63	-2.89	-4.30
	(0.63)	(0.02)	(0.56)	(3.07)	(3.51)	(2.63)	(0.81)	(4.13)	(5.01)
Real Interest Rates	0.10	0.11	0.10	0.17	0.16	0.14	0.07	0.19	0.28
	(1.47)	(1.54)	(1.49)	(3.32)	(3.37)	(2.47)	(1.27)	(3.95)	(3.95)
Growth Tobin´s q	3.17	3.47	3.16	3.70	3.89	4.72	5.64	3.80	3.28
	(2.70)	(2.76)	(2.82)	(3.88)	(4.27)	(4.80)	(5.45)	(4.26)	(2.52)
R&D in manufacturing as a share of investment	11.30	9.86	11.59	15.34	13.63			13.99	20.16
	(3.91)	(3.73)	(3.85)	(6.88)	(6.84)			(6.92)	(6.34)
Corporatism index	1.73		2.26	2.05	1.75	1.07	0.89	0.66	2.59
	(2.08)		(2.69)	(2.75)	(2.42)	(1.41)	(1.17)	(0.85)	(2.33)
Centralization index		0.32	-0.68	-0.78	-0.71	-0.49	-0.53	0.03	-0.62
		(0.46)	(0.93)	(1.23)	(1.08)	(0.66)	(0.75)	(0.04)	(0.83)
Exports Growth				0.21	0.18	0.18	0.13	0.20	0.13
				(5.07)	(4.81)	(4.92)	(2.93)	(5.35)	(4.09)
Capital Stock per worker. Growth rate					22.60	29.51	28.67	19.62	-4.02
					(2.02)	(2.75)	(2.59)	(1.73)	(0.23)
Total R&D as a share of investment						10.59			
						(4.46)			
R&D in non-electrical machinery as a share of investment							3.69		
							(3.89)		
Average years of higher schooling in the total population over age 25								1.07	
								(2.56)	
Number of Students in Universities as % of total population									1.88
									(2.75)
N	45	45	45	45	45	45	45	45	45
R2	0.49	0.45	0.49	0.65	0.68	0.77	0.56	0.74	0.74
s.e	1.10	1.15	1.11	0.94	0.91	1.00	1.07	0.85	0.99