

Catching up to the European core:
Portuguese economic growth, 1910-1990

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Abstract

This paper analyses the causes of Portuguese catching-up to the European core, in the twentieth century, within a growth accounting framework. It concludes that investment in human and physical capital was the main driving force of economic growth and that variation in output growth rates are attributable to changes in total factor productivity growth. The paper explains the decline in TFP growth after 1973 in terms of structural change in the industrial sector.

Key words: Portuguese economic growth; Convergence; Total factor productivity growth; Structural change.

1. Introduction

The nineteenth century saw the levels of income per capita of the poor economies of the western European periphery diverge from those of the first industrializers. Then during the twentieth century, there was a convergence of incomes per capita within the whole continent, though this was concentrated in the years 1950-73.¹ This last period has been intensively examined in cross-country comparative studies. Yet, our understanding of the causes of convergence can be improved by looking at a longer period and the experience of individual countries.

Portugal had a particularly good performance in the twentieth century and caught-up to the levels of income per capita of the European core, although there was a substantial reduction in the rate of convergence after 1973.² Traditional explanations of the growth and slowdown of the Portuguese economy have put more emphasis on internal factors. Changing policy options Government deficits, rapid monetary expansion and the inflation that characterized the Republican period (1910-26) have been held responsible for economic stagnation. The accession of Salazar to the ministry of Finance, in 1928, following the military coup two years before, marked the emergence of the authoritarian Estado Novo and greater monetary and financial stability. Yet, according to some authors, that stability did not lead to higher levels of economic growth because the government imposed a rigid control of the economy through agricultural and industrial policies aimed at controlling investment,

¹ See Tortella (1994) and Maddison (1995). See also Lains (2002).

² See Maddison (1995 and 2001) and country studies in Crafts and Toniolo (eds.) (1996). For Portuguese economic growth in the twentieth century, see also Mateus (1998) and Lains (2003b, Chapter 6).

output and prices. This mirrored similar policies in contemporary fascist Italy. The industrial policies under the designation of *condicionamento industrial* and the wheat campaign (*campanha do trigo*), introduced in 1926 and 1929, as well as the first national plan for 1935-50, are the best examples of the interventionist stance of the *Estado Novo*.³

The standard explanation for the resumption of growth after World War II is that the dictatorship government imposed a 'strategy aimed at economic growth and structural change'.⁴ Higher growth of the post World War II period is traditionally attributed to Portugal being a founding member of the European Free Trade Association (EFTA), created in 1960, which implied a shift towards open trade policies and liberalization of domestic prices.⁵ However, according to the same perspective, the economy did not expand as much as it could have because the government kept the budget balanced and markets were not fully liberalized.⁶ The slowing down of economic growth that followed is attributed to the aftermath of the revolution that ended the dictatorship, in 1974, and the nationalization spree in 1975. The privatization of major financial and industrial firms, starting in 1982, and Portugal's accession to the European Economic Communities (EEC), in 1986, would appear to have set the economy on the path of renewed growth again. Joining the EEC meant an intensification of the liberalization procession, and the level of state intervention in the country would have been finally brought into line with the rest of Western Europe. However, the relationship between changes in economic policy, changes in economic growth, and convergence is weaker than it is often posited.⁷

³ See, among others, Rosas (2000, Chap. 2). For the analysis of agricultural growth in this period, see Lains (2003a).

⁴ Marques (1988, pp. 23-26). See also Rosas (2000, Chap. 2).

⁵ Lopes (1994).

⁶ Moura (1973)

⁷ See Costa Lobo (2000).

Some economists have questioned the dominance of internal factors in shaping the pattern of growth of the Portuguese economy. Lopes (1996), recognizes that both internal and external factors were relevant for ‘the acceleration of economic development, macroeconomic stability and increasing openness of the economy, after 1950’ but he stresses that ‘it was above all because of foreign stimuli that the Portuguese economy expanded as it did and became more open to foreign relations’. The same author holds that economic growth slowdown after 1973 was also a consequence of ‘external factors’.⁸ In order to explain the change in the rhythm of growth after 1973, Mendes (1993) argues that ‘it was the reduction by half of the growth rate of the European Communities during the 1970s and 1980s that provides the fundamental explanation for the slowdown in reducing the income gap between Portugal and the centre’. Moreover, according to the same author, the halt in convergence can be explained by Portugal’s balance of payments problems and deteriorating terms of trade losses of the 1970s and 1980s.⁹ Skeptical about policy and external sector explanations, this paper examines Portugal’s long-run economic performance during the twentieth century and its catching-up to the European core, using parameters from augmented Solow models in order to estimate the effect of input and total productivity growth on output growth. Changes in total factor productivity growth are then related to structural changes, particularly in the industrial sector, along demand patterns.

2. The comparative performance of the Portuguese economy

The development of the Portuguese economy during the twentieth century has been influenced by the evolution of the European economy. In particular, Portugal was affected by

⁹ Mendes (1993, p. 13).

the international financial disequilibrium in the period after World War I and took part in the general economic expansion in the second post-war period ending in 1973. But trends in economic growth and fluctuations in Portugal and the rest of Europe also show many important differences. Graph 1 depicts an index for the growth of Portugal's real income per capita and for the growth of an unweighted average income per capita for nine European core economies from Maddison (1995 and 2001).¹⁰ Table 1 shows annual growth rates between the peak years of the two GDP series.

TABLE 1 AND GRAPH 1 ABOUT HERE

During World War I, both the Portuguese and the European economies were in decline, and income per capita reached a trough at the end of the war. The two indices increased after the war, but while the European index peaked in 1929, Portugal's income growth hit its high point in 1934. Growth was concentrated before monetary and price stabilization was achieved, in 1924. Thus, Portugal experienced an inflation-growth cycle during the interwar period, similar to that of France.¹¹ Growth resumed at the end of the 1930s, and another peak in the income per capita series was reached in 1947. Portuguese economic growth was comparatively high during World War II, whereas the European

¹⁰ Portugal's income per capita series is based on Batista *et al.* (1997) linked in 1953 to that of Pinheiro (ed.) (1997) (as reported in Maddison, 2001). For further details, see Lains (2003b, Apêndice estatístico). These indices are based on direct evaluations of output. The alternative series from Nunes *et al.* (1989) is an indirect estimate, based on the evolution of government revenue and expenditure, and imports. The indirect estimate implies a steep decline of income per capita from 1910 to 1921 and a steep recovery thereafter. It also shows a decline in the trend growth rate after 1932. See Lains and Reis (1991). The nine European core economies are: Belgium, Denmark, France, Germany (West Germany to 1991), Italy, Netherlands, Norway, Sweden and UK. Austria and Switzerland were excluded, because of the poor income data for the period prior to 1950 (Maddison, 1995, pp. 126 and 135).

¹¹ Monetary stabilization was achieved before Salazar came to power in 1928. See Valério (1994), Carvalho (2001) and Lains (2003b, chap. 5).

economy, as represented by our average index for nine countries, was negatively affected by the war and it hit a trough in 1945. However, the recovery started earlier in Europe, where economic growth resumed immediately after 1945. In contrast, the Portuguese economy remained virtually stagnant from 1947 to 1950. From then on, the economy expanded consistently for over two decades in Portugal and the nine core European economies, with a rapid acceleration of convergence during the 1960s, and a new coincident peak in 1973. After 1973, there was divergence until 1986 when Portugal resumed rapid growth.

Table 2 shows growth rates according to Maddison (1995)'s phases of economic development in the twentieth century. We observe that Portuguese income per capita increased at a faster pace than the index for the European average in every phase, except during 1913-29 and 1973-86. The table also shows growth rates for Spain and Greece. Within this group of countries, Portugal had a better performance in the interwar period, while civil wars raged in Spain (1936-39) and Greece (1946-49). During the second post war period, growth rates in these three countries were similar, with Greece expanding at a slightly higher rate. After 1973 the Portuguese economy fared better and was second only to Ireland.¹²

TABLE 2 ABOUT HERE

Table 3 reports unconditional beta-convergence rates for the same growth periods (see also Graph 2).¹³ Portugal was the only country in the western European periphery to converge during the period from 1913-50, although it did so at quite a modest annual rate. From 1950 to 1973, the country converged at higher speed, at 1.85 per cent per year, but Spain and

¹² See Ó Gráda and O'Rourke (1996).

¹³ We consider *absolute* rates of convergence, which do not take into account differences in growth potential or in steady state growth rates, which are obtained by estimates of *conditional* convergence, as defined by Barro and Sala-i-Martin (1995). Aguiar and Figueiredo (1999) show a positive and significant rate of conditional convergence for the Portuguese economy in the long-run (1870-1990), taking into account the initial income level

Greece fared even better. From 1973 to 1998, the Portuguese income per capita also caught up to the average level of the European core, in contrast to what happened to the Spanish and Greek income levels, but it was surpassed by Ireland. Portugal's convergence after the 1973 oil crisis, however, was concentrated in the years between 1986 and 1998.

TABLE 3 AND GRAPH 2 ABOUT HERE

Despite economic growth having slowed down after 1973, the trend growth rate of the Portuguese economy was higher than the trend before the golden age of European growth, as shown in Graph 3. Thus, Portugal fits what Crafts and Mills (1996) termed the 'reverse Janossy hypothesis', what implies that, during 1950-73, there was a 'greater accumulation of technological capability', as well as of infrastructures and economic institutions, which helped to increase the trend growth for the Portuguese economy after 1973.¹⁴

GRAPH 3 ABOUT HERE

3. Accounting for economic growth

Neo-classical growth theory attributes the sources of output growth to the accumulation of human and physical capital and to exogenous technological change. The sources of growth are measured through a production function with constant elasticities. According to Maddison (1995 and 1996), growth accounting models explains fairly well the catching-up process of western European income levels to that of the USA, which had the highest average productivity level in the twentieth century. The model shows that for 1950-73

and degree of openness of the economy.

¹⁴ Crafts and Mills (1996, pp. 416-7). The Janossy hypothesis implies that reconstruction from war damage had an important role in the high growth levels observed in the 1950-73 period and that the rates of economic growth would return to the levels previous to the war. That did not happen in most European economies.

most European economies converged because they had higher growth rates of *both* capital stock and total factor productivity than the USA.¹⁵

Table 4 shows the growth of inputs for Portugal. Both human and physical capital expanded more rapidly after 1947. In the case of human capital, which is measured as the average of years of schooling of the active population, there was a decline in its growth rate between 1910-34 and 1934-47, from 2.08 to 1.14 per cent per year, after which its growth increased to 2.47 per cent, in 1947-73, and to 4.83 per cent, in 1973-90. The rate of growth of physical capital doubled twice between 1910 and 1973, from 1.25 per cent per year, in 1910-34, to 3.89 per cent, in 1934-47, and 7.73 per cent, in 1947-73. After 1973, the rate of growth of capital stock declined but it remained higher than it was before World War II.

TABLE 4 ABOUT HERE

Table 5 shows growth accounts for twentieth century Portugal, based on the ‘average production function’¹⁶ by Nehru and Dhareshwar (1994). The first conclusion we may draw from the table is that Portuguese economic growth was more dependent on capital deepening. This development was most striking in the years 1934-47, but it can also be seen in 1947-73 and 1973-90, when capital growth accounted, respectively, for 49.9 and 44.3 per cent of domestic output growth.¹⁷ The contribution of human capital growth was relatively small in

¹⁵ See Maddison (1995, pp. 40-9). See also Denison (1967), Dowrick and Nguyen (1989), Crafts and Toniolo (1996) and Crafts (2000). This was also the case of Spain, in the 1965-90 period. See Prados de la Escosura and Sanz (1996, p. 359).

¹⁶ Temple (1999, p. 120).

¹⁷ The fact that we used constant factor shares implies that the contribution of human capital to total output growth is probably overestimated in the earlier periods. A referee proposed an alternative estimate, according to which the sum of the labor and human capital share is fixed at 60 per cent, the contribution of human capital increases from 10 to 40 over the period and that of labor force declines from 50 to 20 per cent. This alternative estimate reduces the impact of human capital on growth, in the periods from 1910-34 and 1934-47, and implies a

the years to 1973 and it increased to 41.0 per cent during the last period in the table. Total factor productivity growth had its highest contribution to total output growth in the 1910-34 period, whereas in 1934-47 it was slightly negative. For 1947-73, the contribution of productivity growth in Portugal was smaller than in the rest of western Europe. The role of TFP growth in Portugal's growth experience is in accordance to what happened to the Asian 'tigers', as well as other medium income countries in the post world War II period. This form of 'extensive growth' was also common to some eastern European countries, such as Czechoslovakia and East Germany, and stands in contrast to the "intensive growth" model of western Europe during the post-war period.'¹⁸

After 1973, there was a substantial fall in the contribution of total factor productivity growth that was, in part, due to the increased rate of growth of human capital offsetting the reduction in physical capital growth. The decline in the contribution of total factor productivity, after 1973, is in accordance with the general European experience.¹⁹ For this period, the contribution of capital growth to total output growth declined only slightly and the decline in the rate of growth of total output can be ascribed mainly to the decline in the contribution of total factor productivity growth.²⁰

stronger reduction in the contribution of TFP growth to total growth, after 1973. The alternative figures for the last column on Table 5 are as follows: 1910-34, 45.2%; 1934-47, 1.4%; 1947-73, 35.4%; and 1973-90, 10.7%.

¹⁸ It should be note, however, that the labor input had a higher contribution in the Asian fast growing countries. See Young (1995). See also Mateus (1995b), for a comparison of east Asia and Portugal. On the medium income countries, see Syrquin (1994) and on central Europe, see van Ark (1996b, p. 298).

¹⁹ For growth accounting exercises with similar conclusions for Portugal, see Neves (1994 and 1996), Mateus (1995a, 1995b and 1998), Lopes (1996) and Amaral (2002). For Europe, see van Ark and Crafts (1996, pp. 5-6).

²⁰ An alternative growth accounting model is proposed by Afonso (1999), where output growth is a log-linear function of investment per worker, imports of machinery per worker,

TABLE 5 ABOUT HERE

Levine and Renelt (1992) propose an alternative augmented Solow model to estimate elasticities of income growth with respect to a series of exogenous variables for a sample of 103 countries in the 1960-85 period. Crafts and Toniolo (1996) use one of Levine and Renelt's equations in order to 'consider what new growth theory might suggest for the speeding up and slowing down of European growth' in the three Maddison's phases of development for the twentieth century.²¹ Income per capita growth is explained by the initial income per capita in relation to the US level, the investment ratio, secondary and primary enrollment ratios, the ratio of government expenditure to GDP, and population growth.²² The Levine-Renelt model accurately predicts the growth of the European economies during 1923-38 and 1950-73, but it underestimates growth for 1973-89. The major differences between the periods before and after 1973 are the higher negative effect of the initial income per capita level, which is of decreasing importance, as the average income of the sample of European

and exports per worker. The author also adds as an exogenous variable average TFP growth of the Europe Union (12 members), in order to capture the convergence effect. According to this author, the growth of the Portuguese economy in 1960-73 was led by the growth in capital stock and total factor productivity. The contribution of these two factors of growth added to 93.4 per cent of output growth. For 1974-85, the author finds a reduction in the explanatory power of capital deepening and labor productivity growth, and a negative contribution of capital productivity. For the period after 1986, capital and total factor productivity are again the two main sources of growth, although at a lower rate of total output growth.

²¹ Crafts and Toniolo (1996, pp. 17-8). The Levine and Renelt (1992) model is an augmented Solow model of the Mankiw, Romer and Weil (1992) type. See Temple (1999).

²² Levine and Renelt (1992) also tried export share growth but it was not important. See below.

countries approached the US level, and the government expenditure share, which also had a higher negative effect.²³

TABLE 6 ABOUT HERE

The Levine-Renelt model can be used to determine the extent to which Portugal's growth performance was in accordance to a world 'norm'. The results for Portugal are shown in Table 6. We conclude from the data in that table that the model is a relatively good predictor for Portugal's income per capita growth in 1910-34 and 1947-73, although in the second period it slightly underestimates the actual growth rate (4.84 vs. 5.03 per cent). However, the model does not account for the slowing of Portugal's economic growth during the interwar period, as it does not capture the inflation-growth effect down to 1924 and the negative impact of the stabilization program thereafter.²⁴ For the period after 1973, despite the reduction in the initial income gap and the increase in the government share, which have negative coefficients, the model predicts an increase in the annual growth rate of the Portuguese economy, from 4.84 to 5.25 per cent, whereas actual growth declined from 5.03 to 2.32 per cent. The reason for this forecast error is that Portugal's investment and school enrolment ratios remained considerably high after 1973.

Clearly, in comparison to the European experience, Portugal's initial income per capita had a lower negative effect, which was due to a larger gap for Portugal relative to the US. The investment effect for Portugal was comparable to that of Europe, whereas the sum of the human capital effects was lower for Portugal, as was the government share effect. The estimates for 1973-90 depict Portugal as an outlier, as the forecast income per capita growth rate is 5.25 per cent, whereas the actual growth was only 2.32 per cent. This indicates that the observed reduction in Portugal's income growth after 1973 cannot be attributed to the

²³ See Crafts and Toniolo (1996, Table 1.11).

²⁴ Carvalho (2001).

performance of either the investment ratio or the investment in human capital as measured by the school enrollment ratios. It is important to note that the growth predicted by the Levine and Renelt model for Portugal during 1973-90 is close to the growth rate of the Portuguese economy, if the 1947-73 rate of convergence was maintained in the post-1973 period.

The coefficient for exports is not statistically different from zero in any of the equations in Levine and Renelt (1992). This result seems to contradict the generally held assumption that foreign trade is a major factor of growth in small open economies, but it is in accordance with this additional evidence for Portugal.²⁵ The openness to trade of the Portuguese economy, which was quite considerable, throughout the second half of the twentieth century, occurred in two phases. The first phase followed membership of EFTA and the ratio of foreign trade to GDP increased from about 17 per cent to 30 per cent, from 1960 to 1973. In the next period to 1986, the ratio remained constant. The second phase followed entrance into the EEC. From 1986 to 1994, the ratio increased from 30 per cent to about 55 per cent.²⁶ In 1994, Portugal was ranked as the fourth most open economy in the European Union.²⁷ The fact that the increase in foreign trade was more rapid in the 1986-94 period, which had slower growth than in the period 1950-73, is indicative of the small explanatory effect of trade in Portuguese growth. In fact, according to Mendes (1993), the effect of European integration on Portugal's economic growth was relatively small. He estimates that the participation in EFTA and the 1972 trade agreement with EEC explains between 2 and 2.5

²⁵ Empirical tests on the export-led growth model have generally refuted a direct causality link between exports and growth. According to Levine and Renelt (1992) findings, trade and growth are linked through investment. Pereira and Xu (2000) find out that the link is through investment *and* employment. See also Pessoa (1998) on the negligible effect of openness on Portuguese economic growth throughout 1960-90.

²⁶ The ratio is defined as the average of exports and imports over GDP, from Lopes (1996, Graph 4.1).

²⁷ See Barbosa *et al.* (1999, p. 149).

per cent of Portugal's growth of per capita income; and that the gains from joining the European Union accounted for 10.1 per cent of the income per capita growth.²⁸

Trends in investment ratios with respect to both physical and human capital explain the increase in growth rates during the two decades following World War II, but they fail to explain the slowdown after 1973. In fact, there were significant investments in human and physical capital in the 1950-73 period for Portugal. Yet, after 1973 there was a sharp decline in the overall rate of growth of the Portuguese economy.

4. Structural change and economic growth slowdown

The single most important factor in Portuguese economic growth slowdown after 1973 was the decline in the rate of growth of total factor productivity. In this section we analyse the extent to which the productivity fall is related to changes in the structure of output. Table 7 shows the performance of total productivity in the three sectors of the Portuguese economy during the two development phases, before and after 1973. The growth of total factor productivity for the whole economy fell from 2.64 per cent per year in 1952-73, to 0.31 per cent in 1973-91. Taking into account the behavior of total factor productivity in the three sectors of the economy, the decline in the rate of growth of the Portuguese economy after

²⁸ Mendes (1993, pp. 16-21). The European Union effect is measured through the impact of structural funds alone. See also Gaspar and Leite (1995). Aguiar and Figueiredo (1999) have concluded that Portugal's level of foreign trade ratio, relative to the average of seven more developed European countries, affected positively and significantly the rate of convergence of the Portuguese economy, over the long-run (1870-1990). Yet, they do not provide estimates for shorter periods.

1973 can be seen as a result of the decline in the performance of the industrial and the services sector.²⁹

TABLE 7 ABOUT HERE

In order to explain the fall in industrial factor productivity growth, we need to take into account the major distinctive features of growth in the periods before and after 1973.³⁰ The high levels of industrial growth during the period from 1950-73 were due to the expansion of external demand, induced by European growth and to Portugal's participation in EFTA, as well as to the overall favorable performance of the economy and, in particular, of domestic demand. According to Lopes (1996), the growth of the industrial sector output in the period to 1973 was enhanced by growth inducing government policies, including the protection from foreign competition granted to some branches of industry, fiscal incentives, public investment in social overhead capital and key capital intensive industrial sectors, as well as wage and price controls and low interest rates.³¹ Joining EFTA meant opening up to external competition, but the Portuguese government managed to negotiate gradual and selected reductions in tariff and other forms of domestic protection, whereas Portuguese industrial exports took advantage of the opening up of foreign markets.³²

²⁹ Agricultural labor productivity growth during 1973-90 is associated with the decline in agricultural labor force, by -2.8 per cent per year. Both the decline in labor force and the increase in labor productivity were below rates for most western European countries. See van Ark (1996a) and Lains (2003b, Chapter 6). The decline in total factor productivity in the services sector after 1973 was due to the decline in labor productivity, which is related to the sharp increase in the rate of growth of employment in the sector. This increase is related, on the one hand, to the incorporation of immigrant workers from the colonies, and to the post-1975 employment protection legislation.

³⁰ See Lains (2003b, Chapter 6).

³¹ See also Centeno (1995) and Mateus (1998, pp. 194-8).

³² Lopes (1996, pp. 87-8). See also Macedo *et al.* (1988), Confraria (1999), Amaral (2002) and Lains (2003b, Chapter 6).

After 1973, the share of the more labor intensive sectors in Portugal's industry increased. The sum of the shares of foodstuffs and textiles in industrial value added was 49.4 per cent in 1958, declining to 44.4 per cent in 1973, and increasing to 46.5 per cent in 1980 and 50.1 per cent in 1990. This was offset by the decline of the aggregate share of chemicals, basic metals, and metallurgy, which accounted for 24.7 per cent of the industrial valued added in 1958, 33.9 per cent in 1973 and 33.3 per cent in 1980, and 30.1 per cent in 1990. In terms of their contribution to total output growth, foodstuffs and textiles accounted for 42.7 per cent of total industrial growth during 1958-1973, 50 per cent during 1973-80, and over two-thirds during 1980-90. The more capital-intensive sectors accounted for 35.1 per cent of industrial growth in 1958-73, 42 per cent in 1973-80, and 30.7 per cent in 1980-90.³³

To understand the causes of the fall of factor productivity growth in the industrial sector, after 1973, we have to explain what caused the observed shifts in the structure of the output. According to Lopes (1994), Portugal's industrial labor productivity in relation to the United Kingdom was comparatively higher in the 'traditional' sectors, namely, textiles, wearing apparel, leather and footwear, wood products, paper and electrical appliances. Relative productivity levels in these sectors declined over 1977-90, whereas it increased in the remaining industrial sectors. This implies that the structure of Portugal's industrial output evolved along its structure of comparative advantage. Barbosa *et al.* (1999) showed that labor productivity levels of the industrial sectors with higher growth rates of output and better export performances were below the average of the industrial sector. They find a negative correlation of -0.32 between level of labor productivity and the share of exports in output and a negative correlation of -0.30 between labor productivity and an index of revealed comparative advantages, for 49 industrial sectors, in 1993. According to the same authors, there is no causal relationship between labor productivity and comparative advantages.

³³ See Lains (2003b, Chapter 6). See also van Ark (1996a) and Broadberry (1998).

Instead, they argue that such negative correlations are due Portugal's industrial export sectors being less intensive in the usage of capital and technology and hence their lower levels of labor productivity.³⁴

The fact that increasing specialization along the export sectors led to a decline in the growth of total factor productivity in industry, implies that the short-term gains accruing from specialization along comparative advantage were offset by the losses accruing from the specialization along sectors with lower growth potential. This is in accordance with Amable (2000), who shows that, for 39 countries during the 1965-90 period, the composition of foreign trade is important and that 'trade is beneficial to growth when a country is specialized in industries where world demand is strong', namely electronics. Timmer and Szirmai (2000) find that for some countries there is no 'productivity bonus' accruing from changes in the structure of output, either in terms of labor or total factor productivity, as we have concluded was the case of Portugal after 1973. The evolution of the structure of the Portuguese industrial sector highlights how aggregate demand can induce changes in the structure of the economy and how those changes can have a negative impact on growth rates. The structure of comparative advantages can be endogenous, though, and changed by appropriate policy measures.³⁵

5. Conclusions

Economic historians have shown in the last decades that there is a wide diversity of economic growth experiences across countries. Different experiences stem from differences in the initial conditions for economic growth. *Domestic* conditions for the growth of the

³⁴ See Barbosa *et al.* (1999, pp. 282-4). See also Faustino (1995) and Barros (1997).

³⁵ See Dollar and Wolff (1988), and Cornwall and Cornwall (1994 and 2002).

Portuguese economy have changed substantially, as a consequence of changes in industrial, monetary and fiscal policies, as well as overall political conditions. Yet the *external* conditions for Portuguese economic growth also changed following the transformation of the European and world economy.

The Portuguese economy went through a process of growth and structural transformation during the twentieth century. Before World War I, Portugal was largely an agrarian economy, with about 60 per cent of the population employed in the agricultural sector. By the end of the century, the industrial and the services sectors became dominant. The sheer shift of labor from agriculture to the other sectors of the economy was a source of growth, as the labor productivity in agriculture was about half that of industry and services. This paper has put together evidence showing that high levels of investment in human and physical capital were increasingly important as instruments for rapid economic growth throughout the century.

The catching-up of the Portuguese economy to the European core was, however, more rapid in the period to 1973. The decline thereafter was due to the fall in the rate of growth of total factor productivity in the services and the industrial sectors. The fall in industrial factor productivity growth was due to the observed increase of the relative share of industrial sectors with lower levels of labor productivity. This process occurred in spite of the fact that investment in human and physical capital remained high after 1973. The Portuguese industrial sector adapted to the changes in the structure of demand, within an increasingly integrated European Union. This conclusion implies that the *structure* of exports matters for growth and that it may offset any positive benefits from higher export *levels*. Our result does not imply that protection should be implemented in order to promote the allocation of factors to production oriented towards the domestic sector, as the short term gains of that allocation could be offset by the long term losses accruing from isolation. What is needed are

appropriate policy measures that promote change in the pattern of comparative advantage through investment in research and development in export related sectors with higher factor productivity growth potential.³⁶

³⁶ Grossman and Helpman (1990).

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**Table 1 – Growth of Real Income Per Capita
in Portugal and the European Core, 1910-1990**

(peak-to-peak annual growth rates; per cent)

Portugal		European Core	
1910-1934	1.57	1913-1929	1.35
1934-1947	1.15	1929-1939	1.28
1947-1973	5.03	1939-1973	2.67
1973-1990	2.32	1973-1990	2.05
1910-1990	2.77	1913-1990	2.08

Notes and sources: Batista *et al.* (1997, pp. 93-94) to 1950 and Maddison (2001, p. 278) thereafter. Peak years (1910 excepted) are derived from a log-linear time trend for 1910-1998. ‘European Core’ is an unweighted average index for the following countries: UK, France, Belgium, the Netherlands, Germany (West Germany to 1991), Italy, Denmark, Norway and Sweden.

**Table 2 – Growth of Real Income Per Capita in the
European Periphery and the European Core, 1913-1998**

(Maddison's phases of development; annual growth rates between 3-years averages; per cent)

	Portugal	Spain	Greece	Ireland	European Core
1913-1929	1.35	1.65	2.45	0.33	1.39
1929-1938	1.28	-3.53	1.50	0.87	1.16
1938-1950	1.56	1.48	-2.72	0.94	1.00
1950-1973	5.47	5.63	5.99	2.98	3.55
1973-1986	1.52	1.31	1.75	2.47	2.01
1986-1998	3.45	2.65	1.39	5.42	1.88
1913-1950	1.40	0.31	0.51	0.66	1.21
1950-1973	5.47	5.63	5.99	2.98	3.55
1973-1998	2.40	1.92	1.59	3.81	1.95
1913-1998	2.79	2.20	2.29	2.19	2.06

Sources: See Table 1.

Table 3**Convergence of Real Incomes Per Capita in the European Periphery, 1913-1998**

(Maddison's phases of development; annual growth rates between 3-years averages; per cent)

	Portugal	Spain	Greece	Ireland
1913-1929	-0.04	0.26	1.04	-1.04
1929-1938	0.12	-4.64	0.33	-0.29
1938-1950	0.55	0.47	-3.69	-0.06
1950-1973	1.85	2.01	2.36	-0.546
1973-1986	-0.49	-0.69	-0.26	0.45
1986-1998	1.54	0.76	-0.48	3.48
1913-1950	0.19	-0.89	-0.69	-0.54
1950-1973	1.85	2.01	2.36	-0.55
1973-1998	0.44	-0.03	-0.36	1.82
1913-1998	0.72	0.14	0.23	0.13

Notes: un-conditional beta-convergence defined according to:

$$\phi = [(y_i / y_9)_{(t+1)} / (y_i / y_9)_{(t)}]^{[1 / (t+1 - t)]}$$

where y_i is income per capita for the 4 countries in the table and y_9 is the index for the nine European core countries, as defined in Table 1.

Sources: see Table 1.

Table 4 – Growth of Factors and GDP, 1910-1990

(peak-to-peak annual growth rates; per cent)

	Labor	Human Capital	Capital	GDP
1910-1934	1.00	2.08	1.25	2.17
1934-1947	1.31	1.14	3.89	2.09
1947-1973	0.70	2.47	7.73	5.17
1973-1990	0.05	4.83	5.21	3.92

Notes: ‘Labor’ is total employment estimated as 95% of active population, to 1925, and total number of hours worked of employed population, thereafter. The weekly number of hours worked declined from 48.5 hours in 1925 to 40 hours, in 1990. ‘Human capital’ is the average years of schooling of active population (according to Barro and Lee, 1993), based on Census data; ‘Capital’ is the stock of capital based on the growth of gross domestic capital formation (residential capital excluded).

Sources: Computed from Mateus (1998, Electronic Data Set, File ‘cn_h_sl’, Sheet L). See also Mateus (1998, Apêndice estatístico).

Table 5**Growth Accounting for Portugal: Sources of Growth and Output Growth, 1910-1990**

	Annual Growth Rates					As Percent of Output Growth			
	Labor	Human Capital	Capital	TFP	Output	Labor	Human Capital	Capital	TFP
1910-1934	0.33	0.70	0.42	0.72	2.17	15.4	32.1	19.2	33.3
1934-1947	0.44	0.38	1.30	-0.02	2.09	20.8	18.2	62.0	-0.10
1947-1973	0.23	0.82	2.58	1.53	5.17	4.5	15.9	49.9	29.7
1973-1990	0.02	1.61	1.74	0.56	3.93	0.5	41.0	44.3	14.2

Notes: Sources of growth are based on factor growth rates from Table 4 weighted by factor shares of 1/3, according to Nehru and Dhareshwar (1994). See Mateus (1995b, Tab. 9) and Mateus (1998, Apêndice estatístico).

Sources: see Table 4

Table 6 – Growth Factors According to the Levine-Renelt Model: Portugal, 1910-1990

	Levels				Contribution to Growth (annual growth rates; per cent)			
	1910-34	1934-47	1947-73	1973-90	1910-34	1934-47	1947-73	1973-90
Constant	--	--	--	--	2.01	2.01	2.01	2.01
Initial Income	0.245	0.302	0.208	0.448	-1.08	-1.33	-0.92	-1.98
Investment Share	0.050	0.083	0.209	0.301	0.47	0.77	1.95	2.80
Secondary	0.018	0.057	0.177	0.622	0.02	0.07	0.21	0.75
Enrollment Ratio								
Primary Enrollment	0.582	0.798	1.231	1.373	1.04	1.43	2.20	2.46
Ratio								
Government Share	0.110	0.100	0.099	0.135	-0.70	-0.64	-0.63	-0.86
Population Growth	0.803	1.089	0.201	0.770	0.06	0.09	0.02	0.06
Forecast Growth	--	--	--	--	1.82	2.40	4.84	5.25
Actual Growth	--	--	--	--	1.57	1.15	5.03	2.32

Notes: the contribution of each factor is taken from the parameters of the following equation (see Levine and Renelt, 1992, Tab. 5, col. ii):

$$\text{gyp} = 2.01 - 0.69^* \text{inyp} + 9.31^* \text{inv} + 1.21 \text{sec} + 1.79^* \text{pri} - 6.37^* \text{gov} + 0.08 \text{gpo}$$

(0.83) (0.12) (2.08) (1.17) (0.58) (2.03) (0.18)

N = 103; R² = 0.68; * = statistical significant at the 0.05 level

Sources: 'Initial income level' (inyp): relative income level Portugal/USA in the beginning of each period from Summers and Heston (1988). The value of the observation is the ratio in the table multiplied by the United States 1950 GDP per capita level (i.e. \$US 6,401).

'Investment' and 'Government shares' (inv and gov): GDP shares in current market prices. From Batista *et al.* (1997, pp. 93-4), to 1952; and from Pinheiro (ed.) (1997, pp. 197-200), for 1953-90.

'Primary enrolment ratio' (pri): Ratio of enrolment in public (to 1940) and private (from 1941) primary schools as percent of 5-9 (to 1940) and 6-9 (from 1941) age groups. 'Secondary enrolment ratio' (sec): Ratio of enrolment in general public, general private (from 1917), professional public (from 1929) and professional private (from 1941) secondary schools as per cent of 10-19 (to 1940) and

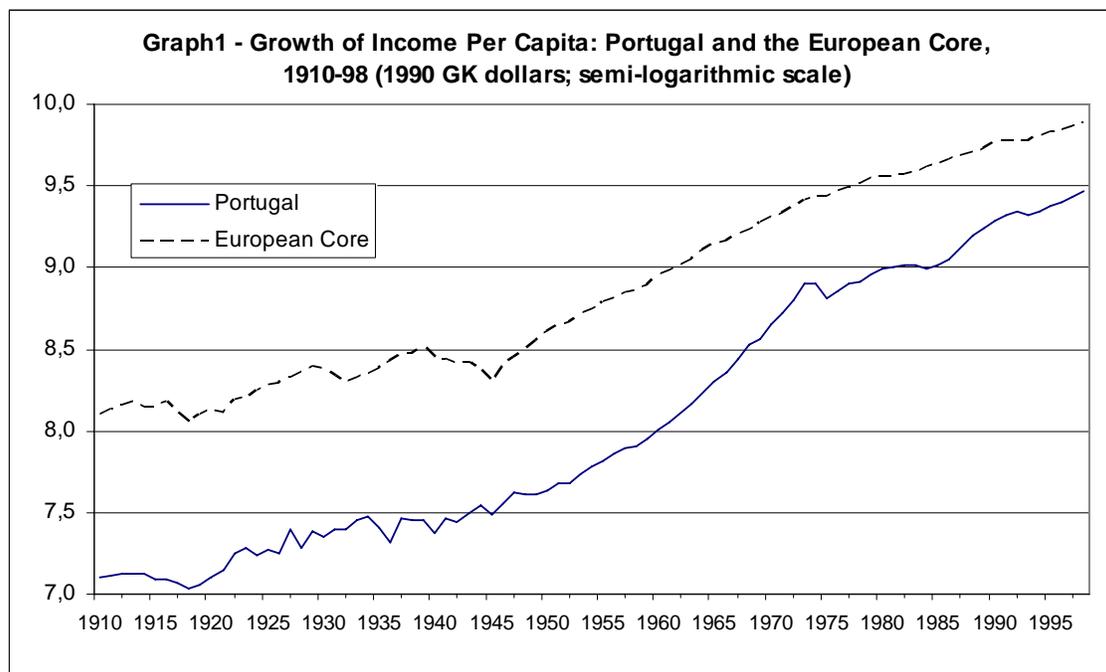
10 to 17 (from 1941) age groups. Sources: Amaral, 2002 (to 1940) and Teixeira (1999, pp. 147-9) (from 1941) and Valério (2001, p. 55). All shares and ratios are averages for the periods indicated. 'Growth of income per capita' and 'Population growth' (gyp and gpo): same as Table 1. See also Crafts and Toniolo (1996, p. 18).

Table 7 – Sectoral Sources of Growth and Output Growth, 1952-91

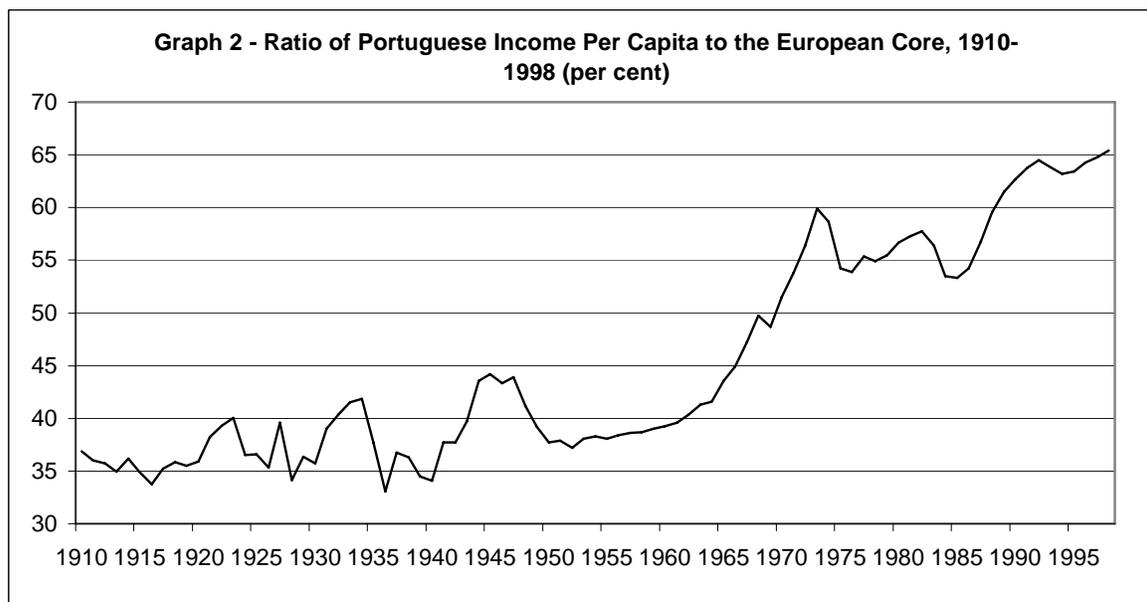
(annual growth rates; per cent)

	Sources of Growth			Output
	Labor	Capital	TFP	Growth
GDP				
1952-73	0.37	2.80	2.64	5.80
1974-91	0.86	1.60	0.31	2.76
Agriculture				
1954-73	-0.33	0.94	0.47	1.09
1974-87	-1.14	0.66	2.23	1.76
Industry				
1954-73	1.02	4.37	3.00	8.38
1974-87	0.72	1.99	-0.90	1.81
Services				
1954-73	0.80	2.79	2.51	6.10
1974-87	2.10	0.96	0.10	3.16

Source: Neves (1994, pp. 72-73). The estimates in this table are not fully comparable to those of Table 5 above, most of all because they do not take into account the role of human capital.



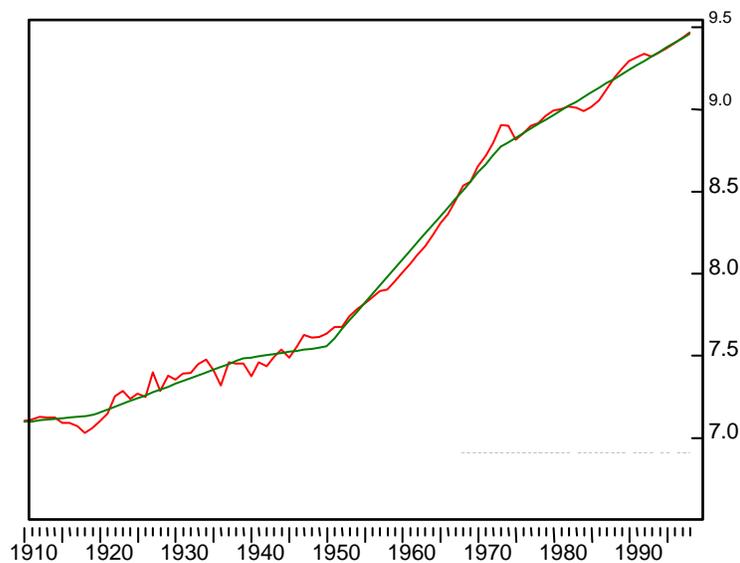
Sources and notes: see Table 1. Values in logs of GDP per capita.



Sources and notes: see Table 1.

Graph 3

Segmented Trend for Portugal's Income Per Capita Growth, 1910-1998



Sources: See Table 1.

Notes: Values in logs of GDP per capita.

The segmented trend is estimated according to Crafts and Mills (1996, pp. 418-9) with break in 1919, 1939, 1950 and 1973.

The estimated equation is as follows (LYP is log of income per capita and D are the time dummies):

$$\text{LYP} = -1.540 \text{ Constant} + 0.005 \text{ Time} + 0.013 \text{ D19} - 0.011 \text{ D39} + 0.046 \text{ D50} - 0.025 \text{ D73} + \text{Ut}$$

(-0.18)	(1.00)	(2.30)	(-2.89)	(13.65)	(-12.08)
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$$R^2 = 0.995; F = 3638$$