

**Rent-Seeking and Economic Growth: Western Europe and East Asia: the Cases of
Portugal and Taiwan, 1950-2007**

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Introduction

The 1997-99 financial crisis in East Asia came timely for a few authors that, in the mid-1990s, started questioning the robustness of the economic performance of the so-called “East Asian Tigers” (Hong Kong, Korea, Singapore and Taiwan) in the postwar period. After decades of admiration in academic and political circles at their extraordinary economic transformation, the crisis granted credibility to the dissenting voices, particularly Kim and Lau (1994), Young (1992, 1993 and 1994) and Krugman (1994). According to Kim and Lau (1994) and Young (1992, 1993 and 1994), there was no “miracle” in East Asian growth, even though the word was then widely used. Through a growth-accounting framework, these authors were able to reach the conclusion that once the tangible factors of production (labor, capital and human capital) were accounted, little to no room was left for Total Factor Productivity (TFP) growth. Growth in East Asia, consequently, was just a question of hard effort and accumulation: more hours spent at work and more physical and human capital accumulation. It was essentially a question of mobilization of resources rather than of its efficient use.

Krugman (1994) went a step further beyond these rather “neutral” conclusions, by positing some forecasting and policy implications. According to Krugman, a major feature of these countries was their authoritarian governments, which were able to compel the population to work and save more, thus fostering capital accumulation and growth. This allowed him to draw a comparison with the USSR, whose fast growth performance in the 1950s had also been a motive of wonder in the West. As Krugman reminded us, the story of growth in the USSR was one of extreme mobilization of resources but also of extreme inefficiency: virtually no innovation whatsoever was noticeable throughout the economic history of the USSR. The ultimate result was, between the 1980s and the 1990s, the collapse of an economy whose factor accumulation was conducted totally outside efficiency considerations. Although never being explicit in the parallel, Krugman’s insinuation was that East Asian economies were milder forms of the same path. Eventually, diminishing returns to capital would set in and slowdown was inevitable. The East Asian Tigers were just, in his own words, “Paper Tigers”.

The 1997-99 crisis seemed to give credence to these views, as the economies of the mentioned Tigers collapsed, as if they had met their “Soviet fate”. For a few years,

the talk in many academic and political circles was no longer of the East Asian Miracle, but rather of how these countries had become corrupt and been captured by “crony capitalists” (for a summary, see Crafts, 1999).

However, there was in the same period another strand of literature that defended the essentially robust nature of growth in East Asia. Although taking for granted Young’s figures and the authoritarian and interventionist nature of East Asian governments, Rodrik (1994) believed the two things were connected and that, still, the result was commendable: with their systemic interventions in the economy, East Asian governments had been able to overcome market failures by distorting prices. The major distortion was in favor of capital income, allowing for the outstanding capital accumulation registered in Young’s growth-accounts and for the outstanding growth performance in these countries. In a later article, Rodrik (1997) was more precise as of why capital accumulation at such high rates was not necessarily going to bring “Soviet collapse” to East Asia. According to him, growth accounting does not allow to disentangle between factor substitution and labor-saving technical progress. Thus, low TFP growth does not necessarily mean that no innovation is being introduced in the economy. It may just mean that technology is not Hicks-neutral, but rather labor-saving and embodied in capital goods. Consequently, diminishing returns would not set in and these economies would continue growing fast in the future.

Additionally, other authors questioned the reliability of Kim and Lau’s and Young’s calculations, namely Klenow and Rodríguez-Clare (1997), Hsieh (2002) or Sarel (1996). According to them, the previous authors’ calculations were dependent on questionable assumptions and, once it was better calculated, TFP performance in East Asia would not have been so dismal. A collection of results coming from this sort of exercise is given in Table I. As we can see the results are quite sensitive to the assumptions, the methods and the data used in each exercise. Still, despite the wide range of figures, the picture looks much brighter than just by taking Young’s results at face value. Also, the most pessimistic analyses seem to be too much dependent on Young’s figure for Singapore.

This rather rosier picture of growth in the East Asian economies squared quite well with an older strand of literature that suggested that the secret of their performance resided precisely in economic policy. This was the proposition of such authors as Johnson (1982), Amdsen (1989) or Wade (1990). For them, East Asian governments corresponded to a model of “developmental state” (a concept with a certain

“Gerschenkronian” resonance – Gerschenkron, 1962) that had been able, through systemic interventions, to change the structure of the economies of the region, by moving resources into ever more efficient and productive sectors. East Asian governments had been able to select certain sectors of higher productivity as the locus of investment, thus leading it from rudimentary agriculture into ever more complex and productive industrial sectors. In a first phase (the 1950s and 1960s) their main concern had been to move resources from agriculture into light manufacturing (such as textiles), but in the following phases (the 1970s and 1980s) resources were moved into such sectors as plastics, chemicals, steel, electronics and computers, all of them with much higher technology intensity.

Whoever was right in this debate, the truth is that, after two to three years of catastrophic performance, the East Asian economies recovered their fast growth rates in the beginning of the twenty-first century. Facts seemed now thus to play again in favour of the “miraculous” perspective of East Asian growth.

The current paper is a contribution to this debate, through a comparison between one of the East Asian Tigers (Taiwan) and a relatively less developed European country (Portugal). We believe the comparison is relevant in many ways. First, both countries had comparable levels of GDP per capita in the immediate postwar years, with Taiwan clearly below (Figure 1). Among other things this is important due to the fact that much of the above discussion compares East Asian economies with rich Western ones. However, the two groups of economies were at widely different levels of relative development throughout most of the period, in particular in the 1950s and 1960s. By comparing economies in a similar league of initial development we can better compare their subsequent performance.

Second, both countries had similar performances from the 1950s and 1960s to the 1970s crisis. However, after 1973, the picture changed drastically (Table II). Taiwan kept on growing very fast whereas Portugal almost collapsed in an initial phase, slowing-down in the long-run in such a manner as to compromise its catch-up process to the rich economies of the world (Figures 1 and 2). Clearly some significant change took place then in Portugal, and a comparison with an economy that was able to grow fast even after the Golden Age of economic growth is certainly relevant.

Third, Portugal had a political regime that was similar to Taiwan’s until the mid-1970s: it was an authoritarian and interventionist regime with certain “developmental” tendencies. Then, democracy arrived in 1974 and, with it, came also a change in the

nature of the government's intervention in the economy. Fast growth in Portugal coincided with the authoritarian phase, slow growth with democracy. Is there a connection between the two facts? Independently of further considerations to be made below, a huge interpretation problem arises here: democratization in Portugal coincided with the 1970s crisis and, consequently, it is very difficult to disentangle the responsibility attributable to the international crisis from the responsibility attributable to the domestic situation. Once again, a comparison with a country that only democratized about twenty years later and that kept on growing very fast is certainly of help.

Finally, the comparison can also be of help to understand the general economic slowdown of European economies after the mid-1970s. In general, the reasons that are pointed out by various authors to explain European slowdown after 1973 relate to an international environment that was no longer favourable to fast growth and catch-up. Richer and poorer European economies alike would have slowed-down due to the same sort of international reasons. Taiwan (and the remaining East Asian Tigers) shows that slowdown was not inevitable even through the less favorable international environment of the 1970s (and beyond). Which has further implications, namely in what refers to the dysfunctionality of the East Asian "model": if Asian growth is mostly explained by the developmental state and if the Asian model became dysfunctional, one should expect a country such as Portugal, that is part of the European institutional environment (a supposedly non-corrupt and non-interventionist framework), to display better growth and innovation performances and be insulated from the negative consequences of crony capitalism. But the figures available do not seem to confirm this hypothesis.

The remainder of this paper goes as follows. In the first section I review the main features of the industrial policies followed in the two countries. In the second section I present the results of a shift-share analysis in which I assess the impact of structural change on labor productivity growth. I use a disaggregated database (with 60 sectors) referred to the period between 1979 and 2002. Additionally, I also use figures for the two economies disaggregated at the level of the three big sectors (agriculture, industry and services). The main conclusions of this section are that, on the one hand, structural change played a negative role in labor productivity growth from the 1980s onwards in both countries, and on the other, that whatever structural bonus there was it was obtained in the transfer of labor from agriculture into industry and services. In the final section I make a few considerations on an agenda for future research based on the

effects of rent-seeking on economic growth. The proposal is that rent-seeking is present not only in less developed countries with interventionist regimes but also in democracies, and that the sort of rent-seeking existing in democracies might be detrimental to growth, contrary to some forms of rent-seeking typical of “developmental states”.

1. Portuguese and Taiwanese industrial policies

All the discussions above revolve around the role of economic policy to foster economic growth, in particular in Taiwan. The less controversial aspect of economic policy in Taiwan has to do with the so-called “fundamentals” or, using another expression, of macroeconomic stability. All works on the East Asian Tigers (from World Bank, 1993, to all those mentioned in Section 1) praise their governments for having been able to keep budgets balanced and, consequently, public debt at low levels and inflation at low rates. These solid fundamentals not only granted a stable environment for investors but also kept the financial sector free of pressure to fund public finances. This allowed the gearing of the financial sector to fund private investment in productive activities.

A more controversial aspect has to do with the role of economic policy to stimulate investment. It is not controversial that the growth of investment was crucial for economic growth in East Asia. What is controversial is the role of economic policy. Krueger (1985) or World Bank (1993) do not favor the hypothesis that government intervention played any (Krueger) or significant (World Bank) role in the growth of investment. But other authors, such as Rodrik (1994) or Aoki, Kim and Okuno-Fujiwara (1996), quite on the contrary propose that growth in investment was orchestrated by economic policy. They posit that East Asian governments were able to distort the remuneration of capital so as to lead economic agents to increase the amount of resources devoted to investment. This is the famous “getting the prices wrong” (Amdsen, 1989) hypothesis, which, if true, would indeed put the government in a crucial position for having engineered the process of economic growth in East Asia.

A connected but slightly different hypothesis states that the effects of government were essentially felt in the financial sector (Hellmann, Murdock and Stiglitz, 1996). According to this hypothesis the financial sectors of East Asian countries were regulated in such a manner as to make them very attractive to the population, which became willing to save and de-hoard, by increasing deposits in banks. Banks would then

make these additional funds available to be invested in the economy. Most crucially, the regulation of the sector gave positive incentives for banks to monitor closely and efficiently the quality of the investments made by the economic agents to whom they provided credit.

A much more controversial aspect of government intervention in East Asia has to do with the policies of “selective investment” in order to keep resources moving from low productivity sectors to high productivity ones. This hypothesis has a long tradition. It normally comes under the heading of the “developmental state” (coined by Johnson, 1982) and was suggested for various countries, such as Japan (Johnson, 1982), Korea (Amdsen, 1989) and Taiwan (Wade, 1990). It has recently been recovered by Rodrik (1994 and 1997) and other authors (see the collection of essays in Aoki, Kim and Okuno-Fujiwara, 1996), and it basically suggests that East Asian governments were able from the 1950s until today to use a series of policy instruments (such as investment subsidies, credit policy, export subsidies, industrial licensing or even public firms) to select particular sectors, either of higher productivity or higher potential of productivity growth, and lead investors to devote their resources to them. According to this hypothesis, sometimes also called the “flying geese” hypothesis (Akamatsu, 1961, and Ito, 2001), the practice allowed East Asian tigers’ economies to keep on moving upward the technology scale in a progressive manner, making them pass from mainly based in underdeveloped agriculture into highly sophisticated sectors.

In Taiwan this would have meant, initially (in the 1950s), a strategy of import substitution, mainly concentrated in the support of such sectors as plastics, artificial fibers, cement, glass, fertilizer, plywood and, in particular, textiles (see Wade, 1990). Thanks to this policy, Taiwan was able to pass from a mainly agricultural economy into a reasonably developed industrial one already by the 1970s. As this initial phase of import-substitution matured, Taiwanese authorities tried in the 1960s and 1970s a more balanced approach, where import substitution was complemented with export promotion (Wade, 1990). The favored sectors were now chemical industries, petrochemicals, steel, cars and electronics. Meanwhile certain light industries exports began conquering the world, particularly textiles and electronics, all under quite discretionary policies to promote exports while protecting the internal market. Finally in the 1980s and 1990s, the international trade connection was accentuated, and it was possible to adopt more open policies, profiting from the ability acquired during the import-substitution phase to develop certain industries that would not have survived

under free trade. Policy got then concentrated in such sectors as shipbuilding, machine tools, electronics (microprocessors) and computers (cf. Wade, 1990).

Many authors have questioned the effects of such policies. World Bank (1993) gives a mixed review of those effects; Krugman (1994) suggests that, even if the practice was able to change the structure of these economies, it had a series of distortionary consequences leading them to low efficiency and ultimate decline. Timmer and Szirmai (2000) show that, in manufacturing, rather than moving resources into higher productivity sectors, these policies had the opposite effect: resources were many times moved into lower productivity sectors. This goes along with what has also been found for Japan, where Beason and Weinstein (1996) have shown the same phenomenon happening. Smith (1994) concludes that industrial policy in East Asia was mostly used to protect low-technology sectors rather than to promote high-tech ones.

A final aspect of the policy interventions of East Asian governments has to do with their political nature. Many of these interventions were only possible under authoritarianism. In order to keep labor moving between sectors, as well as granting a high share of capital in national income, it was necessary to repress labor heavily, which was indeed a feature of these regimes until the 1990s. It was also necessary to keep entrepreneurs under close supervision, and both aspects were strictly dependent on the authoritarian nature of these regimes. Under more democratic and freer regimes it would have been impossible to follow the same sort of practices, as unions would have been less docile and firms more dependent on market forces.

This aspect is particularly important to understand the evolution of economic policy in Portugal. Portugal had an authoritarian regime until 1974, which was also able to repress labor and control the activity of firms very heavily. As a matter of fact, the Portuguese regime shared many of the features of the Taiwanese one. Not only it was authoritarian but also behaved in ways that were similar. It was able to grant macroeconomic stability (the “fundamentals”) to the economy: budgets were kept balanced from the 1930s to 1973, public debt was kept low, as well as inflation (at least until the early-1970s) (Amaral, 2003). Similarly to Taiwan, the main engine of economic growth seems to have been investment, fed by increasing savings and financial intermediation (Amaral, 2003). Again it is not clear what part of investment growth should be attributed to government, but it is at least possible that to keep the share of capital in national income high the repression of labor was as crucial as in Taiwan. Additionally, the Portuguese authoritarian regime also followed a practice of

favoring investment in certain sectors to the detriment of others, using a vast panoply of instruments, such as favourable credit conditions, specific protection, direct government participation or oligopolistic (and even monopolistic) conditions in the preferred markets. This meant promoting certain sectors as textiles, fertilizer, chemicals, paper pulp, cement, oil refining, petrochemicals, steel, shipbuilding or machine tools (cf. Confraria, 1992, Pereira, 2005, and Fernandes, Ribeiro and Carreira, 1987).

The Portuguese case becomes very interesting thanks to the political transformation that took place in 1974, when the country was transformed into a regular European Welfare State democracy. Very little study has been devoted to the effects of this change, but there is no doubt that growth slowed-down considerably after 1974. The problem here is that this coincided with the general slowdown of European growth. It is thus very difficult to isolate the general conditions from the specific Portuguese ones. One hypothesis, of course, is to view Portugal as a specific instance of the general European case. It is no doubt true that Portugal acquired then the institutional characteristics of the remaining European Welfare State democracies and this meant destructing the existing institutional features of the previous regime. The “fundamentals” deteriorated heavily, meaning that a large amount of resources were now devoted to public finance rather than investment in private activities, i.e. no longer the financial sector was geared to the financing of productive private activities but to help the government face its financing troubles; unions were liberated and labor became a much more rigid and expensive factor of production; entrepreneurs were no longer so closely supervised by the government and selective industrial policies were not possible to follow in the same manner as during authoritarianism. Additionally, as Portugal joined the European Economic Community (EEC) in 1986 it had to entirely give up methods of selective protection or export promotion, besides monopoly or oligopoly rights that were typical during the authoritarian regime.

One further important aspect was that taxation and public spending increased very significantly, which meant that a large amount of resources were diverted from private activities into financing public services, such as public administration as well as education and health services. This is to be clearly contrasted with Taiwan, where taxation and public spending was kept at very low levels throughout the entire period under consideration (Figure 3). It is true that Taiwan also entered a process of democratization from the late-1980s until the late-1990s. But this has not put the

country on a path similar to European democracies (cf. Chu, 1998). The lack of development of Welfare State mechanisms in a certain way demonstrates it.

2. Productivity performance and structural change

Table III shows the results of various growth-accounting exercises for Portugal and Taiwan in various sub-periods of the postwar years. Independently of the precise figures presented, it is possible to see that, even if a large part of its growth is explained by the tangible factors of production, Taiwan's performance in TFP is quite respectable. Of particular interest is the fact Portugal's performance is much worse, in particular in the period in which it changed institutions, from an authoritarian and interventionist government to a democratic and non-discretionary one. In terms of the TFP growth debate mentioned above, these results seem to contradict the most negative perspective on growth in East Asia. Also, they put under a quite bad light the performance of the Western European economy.

All this means that we should not accept that growth in Taiwan was just a matter of capital accumulation and seriously consider the hypothesis of significant technological progress. This points most naturally to the possible relevance of the "flying geese" hypothesis: the Taiwanese government would have been able not only to create conditions for fast capital accumulation but also of managing resources in such a way as to promote their shift from sectors with lower technological intensity into sectors with a higher one. This would have meant that the investment policy of the Taiwanese government not only fostered capital accumulation but also technical progress.

We will test this hypothesis using a shift-share analysis, a technique that allows to separate three sorts of effects on labor productivity: intra-sectoral effects, static inter-sectoral effects and dynamic inter-sectoral effects. Productivity can grow thanks to growth that is internal to each sector (intra-sectoral growth) or thanks to the shift of labor from sectors with lower relative productivity levels to sectors with higher relative productivity levels (static inter-sectoral effect) or it can, finally, grow thanks to the shift of labor into sectors with higher productivity growth (dynamic inter-sectoral effect).

The separation between these three effects can be obtained in the following way:

$$P = \frac{Q}{N} = \frac{\sum_i Q_i}{\sum_i N_i} = \sum_i \left(\frac{Q_i}{N_i} \frac{N_i}{N} \right) = \sum_i (y_i S_i) \quad (1)$$

where P is labor productivity, Q is value added, N is labor and i is an index arraying the sectors. Under these definitions, y_i can be interpreted as labor productivity in sector i and S_i as the share of sector i in total employment.

Differentiating $P = \sum_i (y_i S_i)$ gives:

$$\Delta P = \sum_i \left(\frac{\Delta y_{it} S_{i,t-1}}{\Delta y_t} + \frac{\Delta S_{it} y_{i,t-1}}{\Delta y_t} + \frac{\Delta y_{it} \Delta S_{it}}{\Delta y_t} \right)$$

where the first term measures the contribution coming from growth within each sector (intra-sectoral effect), in which productivity growth in each sector is weighted by its employment share; the second measures the contribution coming from labor shifts between sectors of different productivity levels (static inter-sectoral effect), where labor movements are weighted by the productivity level of each sector. This contribution will be higher the higher is the movement from sectors with low productivity levels to sectors with high productivity levels. Finally, we have the third term corresponding to an interaction or dynamic effect, which is obtained as a residual and combines the two previous effects. It will be higher the higher is the ability of the economy to shift labor from slow-growing sectors into fast-growing ones.

The purpose of this text is to try the method above for the full 1950 to 2007 period using as much disaggregated data as possible for the two countries. For the moment, however, I could only find data of that sort for the period between 1979 and 2002. I present the results in this section, while still trying to find other data for the years between the 1950s and 1979. These results must, consequently, be understood as preliminary. Future versions of this paper will try to improve them, mostly in terms of time coverage. The results presented in this section are nevertheless quite interesting, and while additional data will certainly enrich our perspective on the topic, it is not probable that they will change my main conclusions. I used for this paper the 60-sector database provided by GGDC (see references) between 1979 and 2002. Due to some data problems, I restricted the data to 55 sectors. The results are presented in Tables IV to VI. In order to have at least a rough picture of what happened prior to the 1980s, I also used data for the three big sectors of the economy (agriculture, industry and services) from 1960 to 2007 – although some data limitations forced me to use data for Portugal only until 1995. Again, this is something to be improved in future versions of the paper.

According to the figures presented in Table IV most of labor productivity growth between 1979 and 2002, both in Portugal and in Taiwan, came from the intra-sectoral contribution (72% in Taiwan and 82% in Portugal). This means that little of it had to do with structural change. In this respect, it is interesting that the static contribution of structural change (the switch of labor into sectors with higher productivity levels) was even higher in Portugal than in Taiwan (26% versus 14%). Instead, Taiwan's performance was better in the dynamic component of structural change: 14% versus a negative contribution of -8% in Portugal. Taiwan was, thus, more than Portugal able to move labor into sectors with higher productivity growth. Still, the compound effect of the two components is not outstanding in any of the countries (when added, they explain 28% of productivity growth in Taiwan and 18% in Portugal). The consequence of this is that it is not in structural change that we can find the root of the better performance in Taiwan but rather in the ability of having most sectors growing faster than in Portugal.

It is also very interesting that most of the contribution to the growth of productivity in Taiwan did not come from manufacturing sectors but rather from services sectors. The six most important contributions to productivity growth came from Real Estate activities (explaining 11% of the growth of productivity), Wholesale Trade (about 10%), Retail Trade (9%), Financial Intermediation (8%), Health and Social Work (about 7%) and Public Administration (about 7%). Much to note is the fact that these six non-industrial sectors explain more than half of productivity growth in Taiwan in this period (about 52%). Only then comes the first manufacturing sector, Electronic Valves and Tubes (with a contribution of about 5%). Even if the latter was one of the sectors most favored by industrial policy in Taiwan, it is not enough to establish the success of that policy, for the remaining sectors that received particular attention by the government had only modest contributions (see Rubber and Plastics, Basic Metals, Fabricated Metal Products or Office Machinery in Table IV).

Confirming this relatively negative result of industrial policy is the fact that, if we restrict the tests to industry, the results show a negative contribution coming from structural change in Taiwan (-12% in the static component and -16% in the dynamic component – Table VII). The only positive contribution came from the intra-sectoral component (128%). This seems thus to confirm the inability of industrial policy to move labor from low-productivity to high-productivity sectors. It is true that, when restricted to manufacturing, it were those sectors favored by industrial policy that gave

the largest contribution (see Electronic Valves and Tubes, Chemicals, Office Machinery, Fabricated Metal Products or Basic Metals in Table VII). But this was not enough to compensate for the remaining negative effects.

The picture is similar for Portugal (Table IV). Again, the largest contributions came from services: the first four contributors were Education (with 12%), Public Administration (12%), Health and Social Work (10%) and Real Estate activities (9%). Then comes the first manufacturing sector, Construction, with a contribution of almost 9%. The other large contributors were still services activities: Financial Intermediation (with approximately 6%) and Other Community Work (with almost 6%). Again, the most important contributions coming from services sectors, when added (all of the above except Construction), amount to more than half of the growth of labor productivity in Portugal (about 53%). It is not surprising, thus, that in manufacturing we have the same picture as in Taiwan, with a negative contribution coming from structural change (Table VI). The picture is actually worse in Portugal: the static component gave a negative contribution of about -30% and the dynamic component of about -44%. It was up to the intra-sectoral component to contribute with 173% to the growth of productivity in manufacturing.

A subdivision of the whole period of 1979 to 2002 into two smaller sub-periods (1979-1986 and 1986-2002) shows that industrial policy in Taiwan seems to have been relatively more successful in the first period than in the second, although not in a spectacular way (Tables V and VI). The largest contributor in the first sub-period was still a services sector (Retail Trade, with about 8%), followed by Electricity, Gas and Water, a special industrial sector (with a contribution of about 7%). Then came two manufacturing sectors favored by the industrial policy of the period: Chemicals (with about 6%) and Rubber and Plastics (with 5%). But they were immediately followed by two services sectors (Public Administration and Health and Social Work, both with about 5%). A third manufacturing sector much favored by industrial policy (Electronic Valves and Tubes) came next, with a contribution of about 4%. In the 1986-2002 sub-period, however, manufacturing vanishes completely from the first places in terms of contribution to productivity growth. The largest contributor was Real Estate (with 12%), followed by Wholesale Trade (with 11%), Financial Intermediation (9%), Retail Trade (9%), Health and Social Work (7%), Public Administration (7%) and Other Community Work (4%). Overall, these sectors explain about 60% of labor productivity growth in Taiwan in this sub-period.

Given these figures, it comes as no surprise that, when restricted to manufacturing again, the contribution from structural change in Taiwan improves in the 1979 to 1986 sub-period, with the static component contributing positively 1% to productivity growth and the dynamic component negatively only with about -2%. Even if these figures are not as massively negative as in the overall period, they are small and the largest contribution still came from the intra-sectoral component (about 100%). The picture is no longer repeated in the 1986 to 2002 sub-period, with massively negative contributions coming from structural change (-32% from the static component and -8% from the dynamic component).

As for Portugal, services sectors were, in both sub-periods, the largest contributors, although in the second there seems to have been a clear concentration on Public Services (Table V and VI). In the 1979-1986 sub-period Education was the largest contributor (about 9%), followed by Electricity, Gas and Water (8%); then came Wholesale Trade (8%), Health and Social Work (about 8%), Financial Intermediation (about 7%), Public Administration (7%) and Inland Transportation (about 5%). In the sub-period of 1986-2002 there was a massive concentration not only in services but specifically in Public Services. The largest contribution came from Education and Public Administration (both with almost 14%), Real Estate (11%), Health and Social Work (11%), Construction (about 11%), Other Community and Social Work (about 7%) and Communications (about 6%). All sectors with a major public contribution (Public Administration, Education, Health and Social Work and Other Community and Social Work) contributed with almost half of the growth of labor productivity. If we add to them the contributions coming from Real Estate and Communications we have almost 70% of the growth in labor productivity explained in this sub-period.

Most naturally, the same exercise restricted to manufacturing in Portugal yields even smaller contributions from structural change, particularly in the second sub-period. In the 1979-1986 sub-period there was a moderately negative contribution from the static effect (-12%) and a very small positive contribution from the dynamic component (0.3%). Still, the bulk of productivity growth was explained by the intra-sectoral contribution (112%). In the following sub-period, the contribution from structural change was massively negative: -59% from the static component and about -52% from the dynamic component (the two amounting to -111%!). All growth in labor productivity that there was in Portugal in this sub-period was due to the intra-sectoral component (211%!).

These results have very interesting consequences. In the first place, they show that, although Taiwan had a better performance in terms of structural change, it was clearly not enough to explain the difference in productivity growth in relation to Portugal between 1979 and 2002. The contribution from structural change was relatively small and, more significantly so, negative in the manufacturing sector. In the second place, these results do not speak in favor of the positive effects of industrial policy in Taiwan, at least in terms of changing the structure of the economy. Either the actions of the Taiwanese government had a negative impact on that structure or were not enough to compensate for movements of labor in the direction of sectors with lower productivity both of levels and growth. Finally, the results seem to indicate that the major sectoral contributions came from the displacement of labor from agriculture into the two remaining sectors and that, of the two, it was the services sector that seems to have given the largest contribution.

One further way of assessing the impact of structural change in the two economies is to construct a counterfactual scenario in which each of the economies is attributed the sectoral income shares of the other economy. Thus, if we use the value added shares in Taiwan of the 55 sectors listed in Table IV and apply them to Portuguese GDP in order to construct a virtual Portuguese economy (with the value-added structure of Taiwan), we do not find a significant improvement from 1979 to 2002 of the Portuguese level of GDP per capita. To be more precise: if we assumed that the Portuguese economy, instead of having its actual structure, adopted that of Taiwan's in each year of the period, the results would be the ones given in Figure 4. What they show is that higher productivity sectors already had a higher weight in the Taiwanese economy by 1979 than in the Portuguese one. If the Portuguese economy had the structure of Taiwan's in 1979 it would have a GDP per capita about 20% higher than its actual one. This is an undoubtedly significant amount, but afterwards there were no changes in this picture at least until the mid-1990s. From then onwards, until 2002, there were changes, and Portugal's structural position deteriorated, so that by 2002 Portugal would improve its GDP per capita level by 30% by having the structure of the Taiwanese economy. However, when we compare the virtual Portuguese economy with the actual Taiwanese economy we can see a massive closing of the gap between 1979 and 2002. By 2002 the virtual Portuguese economy had an almost similar level of GDP per capita than the actual Taiwanese one, meaning that the structural difference between Portugal and Taiwan was no longer a significant explanation of the difference in GDP per capita

between the two countries. What was significant was the difference in the simple growth of GDP per capita within the existing structure of each economy.

All these results consequently point to a very weak structural bonus both in Portugal and Taiwan if we exclude the one arising from the transfer of resources from agriculture into the non-agricultural sectors. Additionally, they point to a significant contribution coming from services, either bigger or equal with that of manufacturing. In order to confirm the latter idea we made a similar analysis restricted to the three large sectors of the economy between 1960 and 2005 (1995 for Portugal). Again, the most important contribution comes from the intrasectoral component (61% in Taiwan, 73% in Portugal), and grew in time, particularly in Taiwan (50% in the 1963-1973 sub-period, 76% in the 1973-1986 sub-period, 89% in the 1986-1997 sub-period and 83% in the 1997-2007 sub-period, versus the following results for Portugal: 74% in the 1963-1973 sub-period, 83% in the 1973-1986 sub-period and 93% in the 1986-1995 sub-period). Thus, it was only in the 1960s that structural change gave a really significant contribution to productivity growth (of about 50%, with 40% coming from the static component and 10% from the dynamic component). All this seems to confirm the idea that, apart from the switch of labor out of agriculture and into the non-agricultural sectors, the structural bonus was not decisive in any of the economies. Also interesting is the fact that the largest contribution came from services rather than industry, with structural change participating significantly in that contribution. Again, nothing of this speaks in favor of industrial policy.

3. Rent-seeking in democracy and authoritarianism

The results of the previous section would seem to confirm the case against industrial policy in East Asia, as made by Krueger (1985), Kim and Lau (1994), Young (1992, 1993 and 1994) or Krugman (1994). And, in a complementary way, they also seem to add evidence to the general case against industrial policy, as made by Krueger (1974) or Buchanan, Tollison and Tullock (1980). According to these authors, industrial policy just creates opportunities for rent-seeking, with its negative impact on economic growth. However, what to make of the fact that, despite the apparent negative effect (or at least irrelevance) of industrial policy in Taiwan to move resources into high productivity sectors, still Taiwan displayed virtually uninterrupted growth for almost sixty years, among the fastest in the world? And, also, what to make of the fact that a country such as Portugal was able to grow very fast when it had an industrial policy of

the kind that Taiwan had, and then fell into a mediocre path of economic growth when it adopted the more neutral institutional framework typical of Western Europe democracies?

As we have shown above, certain authors (such as Rodrik, 1994 and 1997) prefer to point to the positive effects of policy not on structural change but rather on aggregate conditions allowing for increased capital accumulation and technical change associated with it. This opens a door for rescuing a possible connection between policy and growth, although at an aggregate level. The results above point the possible relevance of this approach, as they show that what distinguished most Portugal and Taiwan was the increased ability of the latter's economy to increase productivity within the existing structure rather than by changing it.

And this leads to new questions. If the results of this paper show that industrial policy in Taiwan created rents that had a negative impact on the structural change of the economy, then a series of issues arise. First, the creation of rents and the rent-seeking behavior associated with it were not enough to prevent Taiwan from having one of the most outstanding growth episodes in economic history. Second, despite the fact that the institutional environment of democratic Portugal was supposedly less favourable to rent creation, the result in terms both of structural change and of intra-sectoral productivity was worse in Portugal than in Taiwan. Finally, an issue that is very rarely raised in the literature: the possible impact of democratic institutions on the creation of rents.

This points to a whole new research agenda, based on a reconsideration of the issue of rents. Perhaps rents and rent-seeking can be used to engineer economic situations leading to fast economic growth, contrary to the suggestions made by the traditional literature on the topic. Perhaps, then, we can hypothesize that certain forms of rents created in democracies and the rent-seeking behavior they generate have a more negative effect on growth than the sort of rents and rent-seeking behavior generated by some authoritarian governments that use industrial policy. Perhaps this is the sort of question that should replace the traditionally benevolent approach used when studying the institutions of developed and democratic western countries. It is interesting that not so long ago, mostly during the 1970s and 1980s crisis, there was a literature that devoted considerable more attention to the potential dysfunctionality of modern democracies (such as Buchanan, Tollison and Tullock, 1980 and Olson, 1982).

Without any pretension to give the final word on the issue, we present the possible lines that such an agenda of research should follow. First, it should be clear that

democracy is a system for the institutionalization of competition between political forces to reach power (Aron, 1997). This distinguishes it from other sorts of regimes, whose intent is precisely the opposite: to suppress competition. Additionally, competition in democracies is devoted to obtain the vote of all of the adult population and not just of sections of it. Since the majority of the population have lower income levels than its richest parts, democracies have an inherent redistributive tendency. This leads the political groups competing for the vote of the population to promise to use public spending in order to correct the imbalance in incomes (Aron, 1997). An immediate consequence is that democracies tend to increase the size of taxation and public spending. A further consequence is that such an increase also increases significantly the room for rent creation and, consequently, for rent-seeking behavior. Even if rents are then used in a more transparent fashion than in regimes where no serious scrutiny exists of the way in which governments use the means at their disposal, still the opportunities for rent creation are huge and its possible negative impact on growth proportional to that size.

Additionally, one well established consequence of all this has been the development of a bargaining structure between the government, political parties and several associations for the advancement of particular interests in society (cf. Buchanan, Tollison and Tullock, 1980, and Olson, 1982). Now this bargaining structure has led to the creation of preferential groups to develop bargaining in the place of voters in general. A point that has already been made about modern democracies is that vote collection has become progressively geared to an assemblage of minority groups to whom certain privileges are promised once the political party making these promises reaches power (Hayek, 1982). This means that such groups may capture the whole bargaining process in order to favor their own specific interests rather than the interests of those they are supposed to represent or those of society as a whole (Olson, 1982). The possible consequence of this might be the creation of rent-seeking behavior that has very much negative impact on an efficient allocation of resources and, consequently, on economic growth (a classical study of those problems in the 1970s and 1980s is Olson, 1982). Examples of this might be unions that bargain not in order to obtain better wages for all workers they are supposed to represent but for a limited number of workers that they actually represent. And a consequence might be the creation of inefficient workplace conditions (with a negative impact on productivity) or a substantial increase in firm costs (with a negative impact on both investment and efficiency). Still other

examples might be the use of public procurement to favor certain activities or firms that are not necessarily the most efficient. Or also to use public resources to favor professional groups (doctors and teachers are typical examples in modern welfare democracies, where the state supplies most of these services) that divert too many resources not only in their benefit but also to use quite inefficient technical practices. It is possible that none of these factors are exactly crucial to explain the economic behavior of democracies under the Welfare State, but they are certainly worth an effort in order to try to assess of their possible effects.

Before we jump to the conclusion that democracies generate these inefficient outcomes, it is worth remembering one or two things. First, that these are just hypotheses or an agenda for future research. Second, that this leaves the question open of why East Asian countries are practically the only examples of well succeeded industrial policies. When we compare their practices with those of other Asian countries or those in Latin America we come to the troubling conclusion that they are quite similar in outlook. So a big question is: why did industrial policy in East Asia worked when it seems to have failed universally in virtually every other country that used it? Again, the question seems to point to the particular way in which rents were used. East Asian countries probably used them in a way that promoted growth, but evidence shows that most of the times rents are created in a way that is harmful to growth. What was East Asia's secret? That is where we should point our efforts in the future.

Conclusion

Despite a series of negative perspectives on economic growth in East Asia that were produced by some reputed economists in the mid-1990s, the economies of the region have rapidly recovered from the 1997-99 crisis. This suggests that their growth stories are more than just a result of accumulation and hard effort, but also of innovation. In this paper I have compared Portugal and Taiwan and showed that Taiwan had a better performance both in terms of growth and innovation than Portugal in the postwar period. This should be surprising, as Portugal's institutional framework should be more favorable to growth and innovation, as it is part of one of the most advanced economic and political areas in the world, the European Union.

In order to make a little more advancement in this topic, I tested one hypothesis that is typical of an important strand of literature, according to which East Asian countries' technological progress came with the passage, orchestrated by their

governments, of resources from low-tech to high-tech sectors. The results of a shift-share analysis do not confirm the idea.

This made suggest a new research agenda, based on a reconsideration of the issue of rents. Perhaps rents and rent-seeking can be used to engineer economic situations leading to fast economic growth and perhaps, then, we can hypothesize that certain forms of rents created in democracies and the rent-seeking behavior they generate have a more negative effect on growth than the sort of rents and rent-seeking behavior generated by some authoritarian governments that use industrial policy. A theme certainly worth more research in the future.

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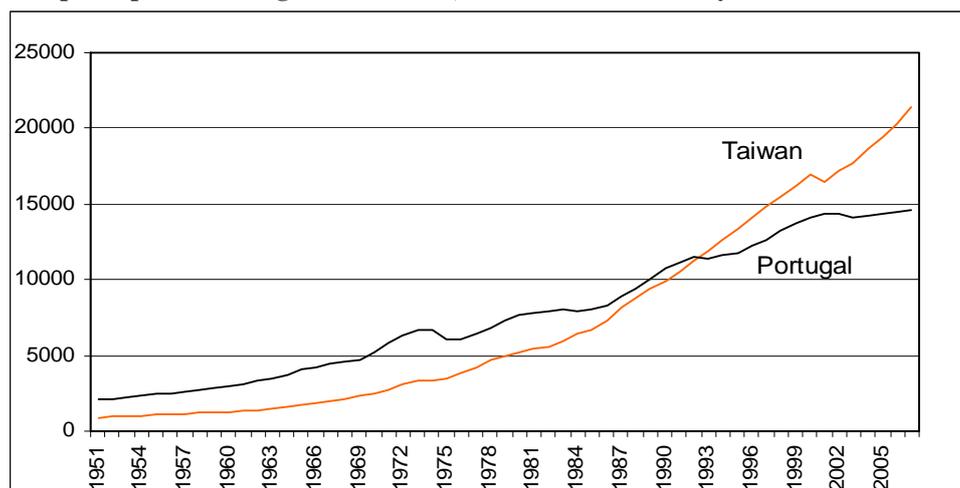
Tables and Figures

Table I
TFP growth in East Asia, 1960s-1990s

	Collins and Bosworth (1996)	Hsieh (2002)*	Iwata, Khan and Murao (2003)	Sarel (1996)	Senhadji (2000)	Thomas and Wang (1996)	Young (1992 and 1993)
	1960-1994	1960s-1990s	1960-1995	1975-1990	1960-1994	1960-1990	1966-1990
Hong Kong		2.1	3.4	3.8			2.3
Korea	1.5	2.1	3.7	3.1			1.7
Singapore	1.5	1.8	3.7	1.9			0.2
Taiwan	2.0	3.8	3.8	3.5			2.6
East Asia average					2.9	1.1	

* We present only some of the estimates given by this author

Figure 1
GDP per capita in Portugal and Taiwan, 1951-2007 (1990 Geary-Khamis dollars PPPs)



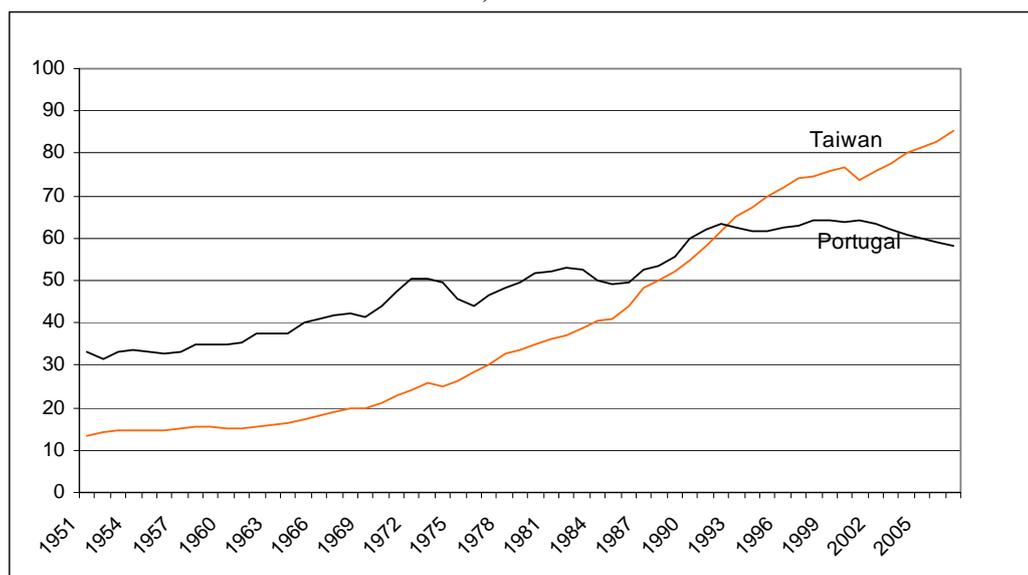
Source: Portugal – own calculations; Taiwan – Statistical Database NSRC

Table II
Growth rate of GDP per capita, Portugal and Taiwan, 1960-2007

Period	Portugal	Taiwan
1960-1973	9.8	12.5
1973-1986	1.8	9.0
1986-1997	4.9	9.3
1997-2007	1.5	4.4

Source: See Figure 1

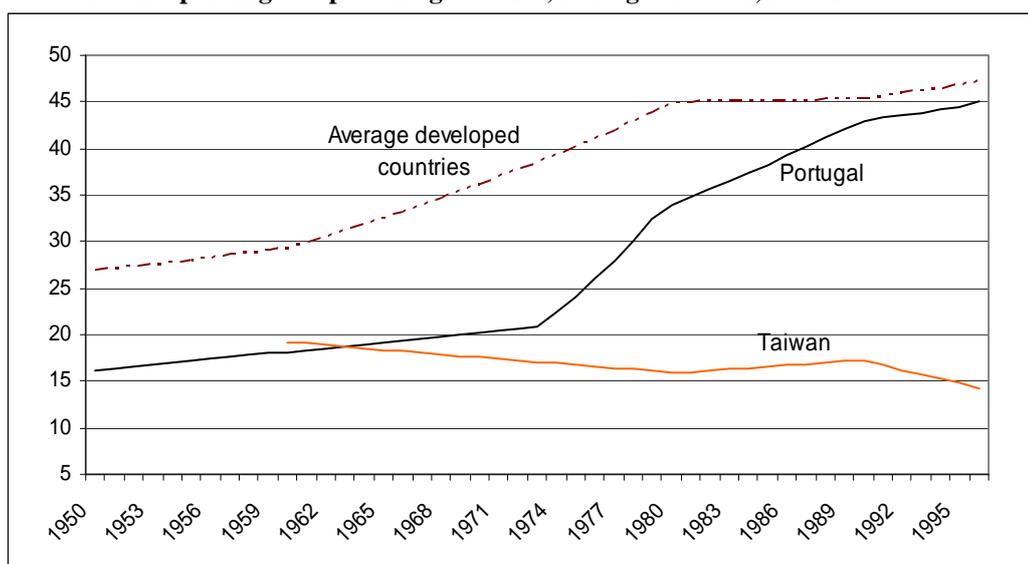
Figure 2
GDP per capita in Portugal and Taiwan as a percentage of GDP per capita in more developed countries, 1951-2007



Source: Data for Portugal and Taiwan as in Figure 1; data on rich countries: GGDC

Note: the rich countries considered for this calculation are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Luxembourg, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom and United States of America

Figure 3
Public spending as a percentage of GDP, Portugal-Taiwan, 1950-2000



Sources: Developed countries - Tanzi and Schuknecht (2000), Portugal -Valério (2001); Taiwan - DGBAS (2004)

Table III
Growth-accounting, Portugal and Taiwan, various dates (%)

		Portugal					Taiwan						
		GDP	Labor	Human capital	Physical capital	TFP	GDP	Labor	Human capital	Physical capital	TFP		
Amaral (2003)	1950-1973	5.61	-0.20	0.96	2.45	2.41							
Lains (2003)	1947-1973	5.17	0.23	0.82	2.58	1.53	Young (1994)	1966-1990	9.6	-	-	-	2.4
	1973-1990	3.93	0.02	1.61	1.74	0.56	Iwata, Khan and Muraio (2003)*	1960-1995	-	0.76	0.19	-	3.8
Mateus (2004)	1950-1975	5.44	0.26	0.63	2.48	2.07	Sarel (1996)*	1975-1990	-	-	-	-	3.5
	1975-1985	3.76	-0.07	1.4	1.72	0.71							
	1985-2000	4.07	0.17	1.57	1.42	0.91							

* In per capita terms

Table IV
Shift-share analysis, 55 sectors, Portugal-Taiwan, 1979-2002 (% contribution for labor productivity growth)

	Taiwan				Portugal			
	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
1 Agriculture	2,69	-2,17	-1,76	-1,24	1,11	-7,36	-0,66	-6,90
2 Forestry	-0,08	-0,15	0,07	-0,16	0,91	-1,24	-0,51	-0,83
3 Fishing	0,46	-0,46	-0,26	-0,26	0,61	-0,75	-0,35	-0,49
4 Mining and quarrying	5,29	-0,42	-4,72	0,15	0,51	-0,09	-0,09	0,33
5 Food, drink & tobacco	1,79	-0,85	-0,66	0,28	4,76	-0,88	-0,98	2,90
6 Textiles	2,47	-1,01	-1,45	0,01	7,98	-2,35	-5,28	0,35
7 Clothing	0,28	-0,77	-0,19	-0,68	0,21	0,88	0,18	1,27
8 Leather and footwear	0,02	-0,12	-0,01	-0,11	0,94	-0,04	-0,05	0,85
9 Wood & products of wood and cork	-0,01	-0,26	0,01	-0,26	1,41	-0,28	-0,40	0,74
10 Pulp, paper & paper products	0,13	0,01	0,00	0,14	1,72	-0,46	-0,64	0,62
11 Printing & publishing	0,16	0,47	0,29	0,93	0,17	0,39	0,06	0,63
12 Mineral oil refining, coke & nuclear fuel	1,69	0,07	0,09	1,85	0,42	-0,23	-0,16	0,03
13 Chemicals	2,29	0,04	0,06	2,39	1,18	-0,88	-0,58	-0,28
14 Rubber & plastics	2,23	-0,40	-0,72	1,10	-0,71	-0,03	0,01	-0,73
15 Non-metallic mineral products	0,61	-0,36	-0,25	0,00	0,92	-0,30	-0,12	0,50
16 Basic metals	1,30	0,25	0,34	1,88	0,75	-1,40	-0,50	-1,14
17 Fabricated metal products	0,86	0,54	0,69	2,09	0,62	0,03	0,03	0,67
18 Mechanical engineering	0,99	0,18	0,26	1,42	0,44	-0,28	-0,16	0,00
19 Office machinery	0,19	0,63	1,49	2,31	0,02	-0,02	0,00	0,00
20 Insulated wire	0,24	0,04	0,06	0,34	0,25	-0,12	-0,15	-0,02
21 Other electrical machinery and apparatus nec	0,48	0,03	0,04	0,55	0,24	0,34	0,14	0,73
22 Electronic valves and tubes	1,25	0,74	2,59	4,58	0,20	-0,11	-0,11	-0,02
23 Telecommunication equipment	0,25	0,05	0,10	0,40	0,03	0,09	0,05	0,17
24 Radio and television receivers	1,26	-0,84	-1,13	-0,72	0,02	-0,03	0,00	-0,01
25 Scientific instruments	0,10	0,07	0,06	0,22	0,17	0,00	0,01	0,19
26 Other instruments	0,19	-0,07	-0,14	-0,02	0,10	0,00	0,00	0,09
27 Motor vehicles	0,68	0,14	0,16	0,97	1,19	0,05	0,19	1,43

		Taiwan				Portugal			
		Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
28	Building and repairing of ships and boats	0,32	-0,15	-0,22	-0,05	0,73	-0,54	-0,60	-0,41
29	Aircraft and spacecraft	0,03	0,04	0,05	0,13				
30	Railroad equipment and transport equipment nec	0,35	-0,07	-0,05	0,23	0,13	0,02	0,06	0,20
31	Furniture, miscellaneous manufacturing; recycling	0,48	-0,49	-0,18	-0,19	1,06	0,10	0,21	1,37
32	Electricity, gas and water supply	2,29	-0,10	-0,19	2,00	4,62	-0,38	-0,81	3,43
33	Construction	0,67	-0,10	-0,02	0,55	8,73	-0,10	-0,11	8,53
34	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	1,04	0,46	0,59	2,09	2,72	0,47	0,25	3,44
35	Wholesale trade and commission trade, except of motor vehicles and motorcycles	2,98	3,03	3,50	9,52	0,44	2,53	0,11	3,08
36	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	9,36	-0,08	-0,25	9,03	1,50	1,11	0,27	2,88
37	Hotels & catering	1,74	0,30	0,89	2,94	1,85	1,31	1,13	4,29
38	Inland transport	2,17	-0,20	-0,35	1,61	1,33	-0,50	-0,26	0,57
39	Water transport	1,98	-0,21	-1,33	0,45	0,30	-0,14	-0,11	0,05
40	Air transport	0,48	0,08	0,16	0,73	0,79	-0,12	-0,11	0,55
41	Supporting and auxiliary transport activities; activities of travel agencies	1,03	0,09	0,27	1,40	1,49	-0,05	-0,05	1,39
42	Communications	1,84	0,29	0,67	2,81	6,65	-0,27	-1,35	5,04
43	Financial intermediation, except insurance and pension funding	1,45	4,24	2,61	8,31	6,23	-0,19	-0,27	5,77
44	Insurance and pension funding, except compulsory social security	0,22	2,02	1,23	3,46	1,18	-0,10	-0,15	0,93
45	Activities auxiliary to financial intermediation	0,04	1,00	0,45	1,50	0,45	0,12	0,16	0,73
46	Real estate activities	2,27	4,83	4,07	11,17	-0,55	10,26	-1,04	8,67
47	Renting of machinery and equipment	-0,10	0,40	-0,18	0,12	0,04	1,95	0,08	2,07
48	Computer and related activities	0,25	0,05	0,61	0,91	-0,18	2,30	-0,80	1,32
49	Research and development	0,09	0,04	0,05	0,18	-0,01	0,46	-0,07	0,38
50	Legal, technical and advertising	0,17	0,85	0,48	1,50	-2,02	9,76	-6,37	1,37
51	Other business activities, nec	0,07	0,28	0,39	0,74	0,16	2,83	0,55	3,54
52	Public administration and defence; compulsory social security	6,32	0,05	0,11	6,48	6,24	3,18	2,36	11,77
53	Education	1,76	0,88	0,90	3,54	3,96	3,94	4,42	12,32
54	Health and social work	1,98	1,03	3,72	6,72	4,18	2,50	3,44	10,12
55	Other community, social and personal services	2,60	0,39	1,00	3,99	3,66	0,73	1,13	5,52
	Total	71,69	14,33	13,99	100	81,87	26,11	-7,98	100

Table V
Shift-share analysis, 55 sectors, Portugal-Taiwan, 1979-1986 (% contribution for labor productivity growth)

	Taiwan				Portugal			
	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
1 Agriculture	1,67	-3,98	-0,37	-2,68	3,05	-9,36	-0,60	-6,92
2 Forestry	-0,15	-0,36	0,06	-0,45	-0,79	-1,66	0,16	-2,30
3 Fishing	0,02	0,31	0,00	0,33	0,55	-1,01	-0,11	-0,57
4 Mining and quarrying	1,17	-1,31	-0,60	-0,75	0,43	-0,23	-0,05	0,16
5 Food, drink & tobacco	5,98	-1,64	-0,79	3,56	3,97	-0,57	-0,14	3,26
6 Textiles	7,58	-2,49	-2,05	3,04	6,95	-0,47	-0,25	6,24
7 Clothing	2,45	0,13	0,05	2,63	2,44	0,58	0,35	3,37
8 Leather and footwear	0,99	0,29	0,23	1,50	0,59	0,77	0,17	1,53
9 Wood & products of wood and cork	1,63	-0,39	-0,35	0,89	0,05	-0,37	0,00	-0,32
10 Pulp, paper & paper products	0,97	0,10	0,03	1,10	3,88	-0,20	-0,17	3,52
11 Printing & publishing	-0,12	0,50	-0,04	0,34	0,84	0,23	0,05	1,12
12 Mineral oil refining, coke & nuclear fuel	1,81	0,90	0,25	2,96	0,49	-0,26	-0,05	0,18
13 Chemicals	6,84	-0,67	-0,67	5,50	4,71	0,08	0,06	4,85
14 Rubber & plastics	3,46	1,27	0,66	5,38	0,16	-0,11	0,00	0,04
15 Non-metallic mineral products	0,66	-0,35	-0,05	0,27	1,81	-0,95	-0,20	0,65
16 Basic metals	2,12	0,70	0,28	3,11	-0,73	-0,48	0,04	-1,17
17 Fabricated metal products	0,81	1,55	0,35	2,71	0,07	-0,10	0,00	-0,03
18 Mechanical engineering	2,16	0,22	0,13	2,51	0,71	-0,21	-0,05	0,45
19 Office machinery	0,20	0,49	0,23	0,92	0,11	0,07	0,01	0,19
20 Insulated wire	0,14	0,13	0,02	0,29	0,11	0,05	0,01	0,17
21 Other electrical machinery and apparatus nec	1,25	0,22	0,18	1,65	0,30	0,14	0,02	0,46
22 Electronic valves and tubes	1,42	1,74	1,28	4,43	0,07	0,05	0,00	0,12
23 Telecommunication equipment	0,21	0,25	0,09	0,55	0,02	0,01	0,00	0,03
24 Radio and television receivers	1,71	-2,04	-0,69	-1,03	0,06	0,04	0,00	0,10
25 Scientific instruments	0,03	0,38	0,02	0,43	0,11	0,02	0,01	0,13
26 Other instruments	0,11	-0,08	-0,02	0,02	0,05	0,01	0,00	0,06
27 Motor vehicles	0,17	0,48	0,03	0,67	0,33	-0,11	-0,03	0,19

		Taiwan				Portugal			
		Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
28	Building and repairing of ships and boats	0,29	-0,28	-0,07	-0,06	-0,12	-0,77	0,04	-0,85
29	Aircraft and spacecraft	0,04	-0,04	-0,01	-0,01	0,00	0,00	0,00	0,00
30	Railroad equipment and transport equipment nec	0,34	0,34	0,05	0,73	0,16	-0,10	-0,11	-0,05
31	Furniture, miscellaneous manufacturing; recycling	0,60	2,40	0,21	3,21	0,48	-0,09	-0,02	0,37
32	Electricity, gas and water supply	5,52	0,55	0,48	6,56	5,47	1,74	1,15	8,36
33	Construction	-0,13	-2,77	0,02	-2,89	6,91	-3,11	-0,72	3,08
34	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	1,24	0,19	0,05	1,48	3,26	0,57	0,10	3,93
35	Wholesale trade and commission trade, except of motor vehicles and motorcycles	0,77	2,55	0,14	3,47	6,80	1,19	0,20	8,19
36	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	7,16	0,43	0,20	7,79	4,00	0,70	0,12	4,82
37	Hotels & catering	1,76	0,76	0,42	2,94	-0,02	2,32	-0,01	2,29
38	Inland transport	2,24	0,15	0,05	2,45	5,56	-0,16	-0,09	5,30
39	Water transport	1,39	-0,08	-0,06	1,25	0,79	-0,02	-0,01	0,75
40	Air transport	1,39	-0,20	-0,21	0,99	1,95	-0,06	-0,03	1,86
41	Supporting and auxiliary transport activities; activities of travel agencies	0,28	-0,09	-0,01	0,17	3,18	-0,09	-0,05	3,04
42	Communications	1,20	0,59	0,16	1,95	3,27	0,29	0,19	3,76
43	Financial intermediation, except insurance and pension funding	1,79	1,82	0,26	3,87	2,73	4,04	0,66	7,44
44	Insurance and pension funding, except compulsory social security	-0,69	3,71	-1,32	1,70	0,52	0,77	0,13	1,41
45	Activities auxiliary to financial intermediation	-0,13	0,47	-0,11	0,22	0,20	0,29	0,05	0,54
46	Real estate activities	9,73	-1,23	-0,83	7,67	-1,41	3,82	-0,26	2,14
47	Renting of machinery and equipment	0,23	-0,31	-0,06	-0,15	-0,23	0,63	-0,04	0,35
48	Computer and related activities	0,08	0,15	0,10	0,33	-0,13	0,36	-0,02	0,20
49	Research and development	0,11	0,05	0,01	0,17	-0,02	0,07	0,00	0,04
50	Legal, technical and advertising	0,25	0,60	0,10	0,95	-0,80	2,17	-0,15	1,22
51	Other business activities, nec	0,14	0,14	0,08	0,36	-0,21	0,57	-0,04	0,32
52	Public administration and defence; compulsory social security	2,89	2,05	0,35	5,29	2,16	4,62	0,31	7,09
53	Education	1,66	1,04	0,19	2,89	2,23	5,54	0,92	8,69
54	Health and social work	1,37	2,12	0,99	4,49	1,60	5,50	0,77	7,86
55	Other community, social and personal services	2,60	-0,21	-0,10	2,29	2,08	0,22	0,05	2,35
		89,41	11,27	-0,68		80,71	16,95	2,34	

Table VI
Shift-share analysis, 55 sectors, Portugal-Taiwan, 1986-2002 (% contribution for labor productivity growth)

	Taiwan				Portugal			
	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
1 Agriculture	2,27	-1,92	-1,26	-0,91	0,33	-7,06	-0,16	-6,89
2 Forestry	-0,04	-0,09	0,03	-0,10	1,22	-0,98	-0,55	-0,31
3 Fishing	0,60	-0,64	-0,35	-0,39	0,50	-0,72	-0,23	-0,45
4 Mining and quarrying	3,00	-0,32	-2,33	0,35	0,48	-0,05	-0,03	0,40
5 Food, drink & tobacco	0,72	-1,00	-0,20	-0,47	4,86	-1,24	-0,86	2,77
6 Textiles	0,94	-1,21	-0,41	-0,68	8,06	-4,59	-5,23	-1,76
7 Clothing	-0,22	-1,38	0,16	-1,45	-0,67	1,58	-0,40	0,52
8 Leather and footwear	-0,25	-0,38	0,15	-0,48	1,37	-0,40	-0,37	0,60
9 Wood & products of wood and cork	-0,30	-0,44	0,21	-0,53	1,72	-0,25	-0,35	1,12
10 Pulp, paper & paper products	-0,07	-0,02	0,00	-0,08	0,90	-1,02	-0,31	-0,43
11 Printing & publishing	0,31	0,43	0,32	1,06	-0,07	0,54	-0,02	0,45
12 Mineral oil refining, coke & nuclear fuel	1,89	-0,16	-0,14	1,59	0,35	-0,27	-0,11	-0,03
13 Chemicals	1,12	0,40	0,16	1,67	-0,09	-2,08	0,05	-2,13
14 Rubber & plastics	2,32	-1,19	-1,00	0,12	-1,01	0,00	0,00	-1,01
15 Non-metallic mineral products	0,55	-0,41	-0,20	-0,06	0,53	-0,08	-0,01	0,44
16 Basic metals	1,25	0,21	0,14	1,60	1,21	-1,57	-0,77	-1,13
17 Fabricated metal products	1,24	0,38	0,32	1,95	0,78	0,07	0,07	0,92
18 Mechanical engineering	0,76	0,27	0,14	1,17	0,33	-0,39	-0,10	-0,16
19 Office machinery	0,40	0,98	1,25	2,63	-0,01	-0,05	0,00	-0,06
20 Insulated wire	0,30	0,02	0,03	0,35	0,32	-0,21	-0,20	-0,08
21 Other electrical machinery and apparatus nec	0,35	-0,03	-0,01	0,30	0,24	0,47	0,12	0,82
22 Electronic valves and tubes	2,30	0,90	1,41	4,61	0,26	-0,18	-0,15	-0,07
23 Telecommunication equipment	0,37	0,00	0,00	0,36	0,04	0,13	0,05	0,22
24 Radio and television receivers	0,69	-0,76	-0,57	-0,65	0,00	-0,06	0,00	-0,05
25 Scientific instruments	0,18	-0,01	0,00	0,17	0,21	0,00	0,00	0,21
26 Other instruments	0,17	-0,08	-0,12	-0,03	0,12	0,00	-0,01	0,11
27 Motor vehicles	0,92	0,06	0,06	1,04	1,35	0,13	0,39	1,87

	Taiwan				Portugal			
	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
28 Building and repairing of ships and boats	0,25	-0,15	-0,15	-0,05	0,72	-0,44	-0,53	-0,24
29 Aircraft and spacecraft	0,03	0,08	0,06	0,17	0,00	0,00	0,00	0,00
30 Railroad equipment and transport equipment nec	0,40	-0,18	-0,11	0,11	0,04	0,13	0,13	0,29
31 Furniture, miscellaneous manufacturing; recycling	0,61	-1,25	-0,33	-0,97	1,21	0,21	0,31	1,73
32 Electricity, gas and water supply	1,69	-0,47	-0,27	0,96	5,22	-1,90	-1,65	1,66
33 Construction	0,72	0,50	0,11	1,33	8,41	1,22	0,86	10,49
34 Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	1,04	0,67	0,52	2,23	2,61	0,50	0,16	3,27
35 Wholesale trade and commission trade, except of motor vehicles and motorcycles	4,13	3,32	3,45	10,90	-1,90	3,53	-0,39	1,24
36 Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	10,13	-0,28	-0,54	9,31	0,62	1,48	0,09	2,19
37 Hotels & catering	2,15	0,31	0,47	2,94	3,24	0,95	0,82	5,00
38 Inland transport	2,20	-0,38	-0,40	1,42	-0,19	-0,98	0,03	-1,13
39 Water transport	2,02	-0,44	-1,32	0,27	0,12	-0,28	-0,04	-0,20
40 Air transport	0,23	0,30	0,13	0,67	0,36	-0,23	-0,04	0,08
41 Supporting and auxiliary transport activities; activities of travel agencies	1,15	0,16	0,37	1,68	0,87	-0,06	-0,02	0,79
42 Communications	2,26	0,29	0,46	3,00	8,34	-0,78	-2,07	5,50
43 Financial intermediation, except insurance and pension funding	1,57	5,48	2,27	9,32	9,30	-2,00	-2,13	5,17
44 Insurance and pension funding, except compulsory social security	1,25	1,05	1,57	3,87	1,77	-0,49	-0,52	0,76
45 Activities auxiliary to financial intermediation	0,16	0,85	0,78	1,80	0,67	0,06	0,06	0,80
46 Real estate activities	0,52	10,40	1,06	11,98	-0,28	11,72	-0,41	11,02
47 Renting of machinery and equipment	-0,12	0,68	-0,38	0,18	0,16	2,26	0,27	2,68
48 Computer and related activities	0,67	0,05	0,33	1,05	-0,23	2,79	-0,84	1,73
49 Research and development	0,10	0,05	0,03	0,18	-0,01	0,56	-0,05	0,50
50 Legal, technical and advertising	0,21	1,05	0,37	1,62	-2,91	11,63	-7,29	1,42
51 Other business activities, nec	0,08	0,47	0,27	0,83	0,34	3,40	0,96	4,70
52 Public administration and defence; compulsory social security	7,97	-0,47	-0,75	6,75	8,82	2,84	1,79	13,46
53 Education	1,98	0,99	0,71	3,68	6,49	3,92	3,21	13,63
54 Health and social work	3,65	1,14	2,44	7,23	7,56	1,62	1,76	10,94
55 Other community, social and personal services	2,50	0,78	1,10	4,38	4,33	1,12	1,21	6,66
Total	71,32	18,58	10,10	100	89,00	24,52	-13,53	100

Table VII
Shift-share analysis, 30 manufacturing sectors, Portugal-Taiwan, 1979-2002 (% contribution for labor productivity growth)

	Taiwan				Portugal			
	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
Mining and quarrying	23,52	-1,87	-21,00	0,66	2,28	-0,41	-0,39	1,49
Food, drink & tobacco	7,97	-3,80	-2,94	1,24	21,24	-3,94	-4,37	12,93
Textiles	10,97	-4,47	-6,44	0,06	35,63	-10,49	-23,56	1,58
Clothing	1,24	-3,43	-0,86	-3,05	0,96	3,94	0,79	5,68
Leather and footwear	0,07	-0,52	-0,04	-0,49	4,17	-0,17	-0,23	3,77
Wood & products of wood and cork	-0,03	-1,16	0,02	-1,17	6,30	-1,24	-1,76	3,29
Pulp, paper & paper products	0,57	0,04	0,01	0,62	7,69	-2,06	-2,87	2,76
Printing & publishing	0,73	2,11	1,29	4,13	0,77	1,74	0,29	2,79
Mineral oil refining, coke & nuclear fuel	7,52	0,29	0,40	8,21	1,89	-1,04	-0,72	0,12
Chemicals	10,18	0,16	0,29	10,63	5,26	-3,93	-2,59	-1,25
Rubber & plastics	9,91	-1,79	-3,22	4,90	-3,19	-0,13	0,05	-3,27
Non-metallic mineral products	2,72	-1,59	-1,11	0,01	4,09	-1,33	-0,54	2,21
Basic metals	5,77	1,12	1,49	8,38	3,37	-6,23	-2,22	-5,09
Fabricated metal products	3,82	2,39	3,07	9,29	2,76	0,12	0,12	2,99
Mechanical engineering	4,40	0,79	1,14	6,33	1,98	-1,27	-0,71	0,00
Office machinery	0,85	2,82	6,61	10,27	0,11	-0,08	-0,01	0,02
Insulated wire	1,06	0,18	0,27	1,51	1,13	-0,55	-0,66	-0,08
Other electrical machinery and apparatus	2,14	0,12	0,20	2,46	1,08	1,52	0,63	3,24
Electronic valves and tubes	5,55	3,31	11,50	20,37	0,88	-0,49	-0,50	-0,10
Telecommunication equipment	1,13	0,20	0,44	1,77	0,13	0,40	0,22	0,75
Radio and television receivers	5,60	-3,75	-5,04	-3,19	0,08	-0,12	-0,01	-0,06
Scientific instruments	0,42	0,30	0,26	0,98	0,78	0,02	0,04	0,84
Other instruments	0,83	-0,30	-0,61	-0,09	0,43	0,00	-0,01	0,42
Motor vehicles	3,03	0,60	0,70	4,33	5,31	0,21	0,86	6,38
Building and repairing of ships and boats	1,42	-0,66	-0,99	-0,23	3,27	-2,41	-2,67	-1,81
Aircraft and spacecraft	0,16	0,19	0,24	0,59	0,00	0,00	0,00	0,00
Railroad equipment and transport equipment	1,54	-0,30	-0,24	1,00	0,56	0,09	0,26	0,91
Furniture, miscellaneous manufacturing; recycling	2,14	-2,17	-0,82	-0,84	4,73	0,46	0,93	6,12
Electricity, gas and water supply	10,20	-0,44	-0,86	8,90	20,62	-1,71	-3,60	15,32
Construction	2,99	-0,46	-0,10	2,43	38,96	-0,43	-0,47	38,05
Total	128,41	-12,09	-16,32	100	173,24	-29,55	-43,69	100

Table VIII
Shift-share analysis, 30 manufacturing sectors, Portugal-Taiwan, 1979-1986 (% contribution for labor productivity growth)

	Taiwan				Portugal			
	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
Mining and quarrying	2,32	-2,61	-1,20	-1,49	1,19	-0,63	-0,13	0,43
Food, drink & tobacco	11,91	-3,26	-1,57	7,09	10,97	-1,59	-0,39	9,00
Textiles	15,09	-4,95	-4,09	6,05	19,22	-1,31	-0,68	17,23
Clothing	4,88	0,26	0,11	5,24	6,74	1,61	0,97	9,31
Leather and footwear	1,96	0,58	0,45	2,99	1,62	2,13	0,47	4,22
Wood & products of wood and cork	3,25	-0,78	-0,70	1,77	0,13	-1,02	-0,01	-0,90
Pulp, paper & paper products	1,92	0,21	0,06	2,19	10,74	-0,55	-0,46	9,73
Printing & publishing	-0,24	1,00	-0,08	0,68	2,33	0,63	0,14	3,10
Mineral oil refining, coke & nuclear fuel	3,61	1,80	0,49	5,90	1,35	-0,71	-0,15	0,49
Chemicals	13,62	-1,33	-1,33	10,96	13,02	0,22	0,16	13,40
Rubber & plastics	6,88	2,52	1,31	10,72	0,43	-0,31	-0,01	0,11
Non-metallic mineral products	1,32	-0,69	-0,10	0,53	4,99	-2,63	-0,56	1,80
Basic metals	4,23	1,39	0,57	6,18	-2,03	-1,32	0,12	-3,22
Fabricated metal products	1,61	3,08	0,70	5,39	0,19	-0,28	-0,01	-0,09
Mechanical engineering	4,30	0,44	0,26	4,99	1,96	-0,57	-0,13	1,25
Office machinery	0,41	0,97	0,46	1,84	0,32	0,18	0,02	0,52
Insulated wire	0,29	0,25	0,04	0,58	0,30	0,14	0,02	0,46
Other electrical machinery and apparatus	2,49	0,44	0,35	3,29	0,83	0,38	0,05	1,26
Electronic valves and tubes	2,82	3,46	2,54	8,82	0,19	0,13	0,01	0,32
Telecommunication equipment	0,43	0,50	0,17	1,09	0,05	0,04	0,00	0,09
Radio and television receivers	3,39	-4,06	-1,38	-2,04	0,16	0,11	0,01	0,28
Scientific instruments	0,05	0,76	0,03	0,85	0,30	0,05	0,02	0,37
Other instruments	0,22	-0,15	-0,03	0,04	0,13	0,02	0,01	0,16
Motor vehicles	0,34	0,95	0,05	1,34	0,92	-0,29	-0,09	0,54
Building and repairing of ships and boats	0,58	-0,55	-0,14	-0,11	-0,33	-2,13	0,10	-2,36
Aircraft and spacecraft	0,07	-0,07	-0,02	-0,02	0,00	0,00	0,00	0,00
Railroad equipment and transport equipment	0,67	0,68	0,10	1,45	0,45	-0,28	-0,29	-0,12
Furniture, miscellaneous manufacturing; recycling	1,20	4,78	0,42	6,40	1,32	-0,25	-0,06	1,02
Electricity, gas and water supply	10,99	1,10	0,96	13,05	15,13	4,81	3,17	23,10
Construction	-0,27	-5,52	0,04	-5,74	19,08	-8,60	-1,98	8,51
Total	100,34	1,18	-1,52	100	111,70	-12,02	0,31	100

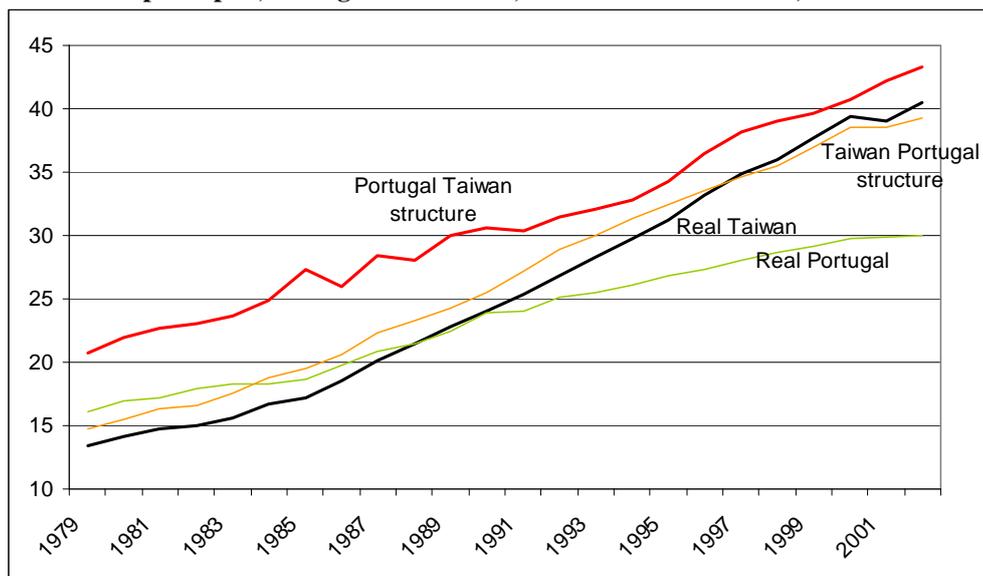
Table VIII
Shift-share analysis, 30 manufacturing sectors, Portugal-Taiwan, 1986-2002 (% contribution for labor productivity growth)

	Taiwan				Portugal			
	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total	Intra-sectoral effect	Static inter-sectoral effect	Dynamic inter-sectoral effect	Total
Mining and quarrying	18,62	-1,96	-14,46	2,19	2,75	-0,29	-0,18	2,28
Food, drink & tobacco	4,48	-6,20	-1,22	-2,93	27,88	-7,10	-4,92	15,86
Textiles	5,85	-7,53	-2,54	-4,22	46,18	-26,32	-29,97	-10,11
Clothing	-1,39	-8,55	0,98	-8,97	-3,83	9,08	-2,27	2,98
Leather and footwear	-1,57	-2,33	0,93	-2,97	7,84	-2,31	-2,10	3,44
Wood & products of wood and cork	-1,86	-2,73	1,32	-3,27	9,84	-1,43	-1,99	6,41
Pulp, paper & paper products	-0,41	-0,10	0,01	-0,50	5,18	-5,84	-1,79	-2,45
Printing & publishing	1,93	2,66	2,01	6,60	-0,43	3,12	-0,13	2,57
Mineral oil refining, coke & nuclear fuel	11,72	-1,00	-0,85	9,87	2,03	-1,56	-0,62	-0,15
Chemicals	6,97	2,45	0,97	10,39	-0,54	-11,92	0,27	-12,19
Rubber & plastics	14,37	-7,40	-6,22	0,75	-5,79	0,01	0,00	-5,79
Non-metallic mineral products	3,44	-2,55	-1,25	-0,36	3,03	-0,44	-0,07	2,52
Basic metals	7,78	1,30	0,86	9,94	6,95	-8,98	-4,44	-6,47
Fabricated metal products	7,72	2,34	2,02	12,07	4,47	0,42	0,40	5,29
Mechanical engineering	4,74	1,65	0,89	7,28	1,86	-2,22	-0,58	-0,93
Office machinery	2,46	6,09	7,76	16,30	-0,05	-0,31	0,01	-0,35
Insulated wire	1,85	0,15	0,17	2,18	1,85	-1,21	-1,13	-0,48
Other electrical machinery and apparatus	2,15	-0,19	-0,09	1,86	1,35	2,70	0,67	4,71
Electronic valves and tubes	14,27	5,57	8,78	28,61	1,49	-1,03	-0,88	-0,42
Telecommunication equipment	2,28	-0,01	-0,01	2,25	0,20	0,73	0,30	1,24
Radio and television receivers	4,27	-4,73	-3,55	-4,01	0,02	-0,32	0,00	-0,31
Scientific instruments	1,13	-0,03	-0,02	1,07	1,21	0,00	-0,01	1,19
Other instruments	1,06	-0,50	-0,74	-0,18	0,69	-0,03	-0,05	0,61
Motor vehicles	5,71	0,37	0,39	6,47	7,74	0,76	2,24	10,74
Building and repairing of ships and boats	1,54	-0,93	-0,93	-0,32	4,12	-2,50	-3,03	-1,40
Aircraft and spacecraft	0,16	0,47	0,39	1,02	0,00	0,00	0,00	0,00
Railroad equipment and transport equipment	2,48	-1,14	-0,66	0,68	0,23	0,74	0,72	1,69
Furniture, miscellaneous manufacturing; recycling	3,80	-7,76	-2,06	-6,01	6,95	1,22	1,75	9,93
Electricity, gas and water supply	10,47	-2,89	-1,66	5,93	29,90	-10,90	-9,49	9,51
Construction	4,44	3,13	0,70	8,27	48,21	6,97	4,92	60,10
Total	140,45	-32,38	-8,07	100	211,32	-58,95	-52,37	100

Table IX
Shift-share analysis, 3 sectors, Portugal-Taiwan, 1963-2007 (% contribution for labor productivity growth)

	Taiwan				Portugal			
	1963-2005				1963-1995			
	Intra- sectoral effect	Static inter- sectoral effect	Dynamic inter- sectoral effect	Total	Intra- sectoral effect	Static inter- sectoral effect	Dynamic inter- sectoral effect	Total
Agriculture	12,75	-2,28	-11,25	-0,78	18,24	-7,00	-12,41	-1,17
Industry	16,62	2,76	14,21	33,59	22,81	2,45	2,88	28,14
Services	31,59	6,22	29,38	67,19	32,24	17,23	23,56	73,03
Total	60,95	6,71	32,34		73,29	12,68	14,03	
	1963-1973				1963-1973			
Agriculture	12,55	-13,73	-4,98	-6,15	18,82	-11,67	-7,39	-0,25
Industry	13,45	16,67	10,04	40,15	26,87	12,10	5,79	44,76
Services	24,04	37,48	4,48	66,00	28,08	19,40	8,00	55,48
Total	50,03	40,42	9,55		73,77	19,83	6,40	
	1973-1986				1973-1986			
Agriculture	6,50	-5,63	-2,87	-2,00	20,31	-11,05	-6,68	2,59
Industry	31,01	10,12	7,26	48,40	23,05	3,24	0,65	26,94
Services	38,66	8,93	6,01	53,60	39,92	23,80	6,74	70,47
Total	76,18	13,42	10,40		83,29	15,99	0,72	
	1986-1997				1986-1995			
Agriculture	2,87	-1,88	-1,26	-0,27	1,26	-4,69	-0,27	-3,70
Industry	48,59	-3,01	-3,99	41,59	53,34	-8,43	-5,27	39,63
Services	37,24	11,66	9,78	58,68	38,84	19,31	5,91	64,06
Total	88,70	6,77	4,53		93,44	6,20	0,37	
	1997-2005							
Agriculture	2,89	-3,58	-1,09	-1,79				
Industry	39,82	-7,94	-2,49	29,39				
Services	40,00	27,80	4,60	72,40				
Total	82,71	16,27	1,02					

Figure 4
GDP per capita, Portugal and Taiwan, real and counterfactual, 1979-2002



Source: See Figure 1 and GGDC