HAS TRADE OPENNESS INCREASED ALL PORTUGUESE PUBLIC EXPENDITURES? A DETAILED TIME-SERIES STUDY

Paulo REIS MOURÃO, PhD*
Department of Economics
University of Minho, Braga Portugal

Article**
UDC 336.127(469)
JEL H7, H87, C23

Abstract

This work aims at identifying the public outlays that have been influenced by the growth of Portuguese trade openness since the end of World War II. For the Portuguese reality, it is one of the first attempts to discuss a large set of simultaneously tested control variables. For this purpose, the methodology started from a model that tries to identify the public expenditures to a system of simultaneous macroeconomic forces and, for testing, it followed the steps associated with cointegration analysis. Using the most convenient techniques, a restrictive set of four expenditures (subsidies, interest payments, other current expenditures, and total public expenditures as a proportion of GDP) was found among the wider set suggested by the Literature. The nature of these expenditures supports the claim that, for the Portuguese case, a particular validity of the compensation hypothesis has been observed. The achieved evidence promotes an important rule: in addition to there being a long-term relation between (some) public expenditures and trade openness, short-term relations may also appear.

Keywords: globalization, economic policy, government expenditure compositionn

1 Introduction

A promising and necessary line of development in the welfare state literature is the attempt to highlight the particularities of each country and for each period. The present

* The author is indebted to two anonymous referees of the *Financial Theory and Practice*, who suggested very interesting revisions of a previous submission. The remaining errors are author's exclusive responsibility

** *Received:* November 7, 2006
Accepted: September 11, 2007

paper draws on the debate about globalization and its effects or lack of effects on the welfare state of a newly developed democracy, Portugal, observed since the end of World War II at the most detailed set of outlays.

The literature in the subject is in agreement that there are three main sets of hypotheses in this globalization problem: the efficiency hypothesis, the compensation hypothesis and the deindustrialisation hypothesis. These hypotheses acknowledge that economic growth serves the interests of virtually all citizens and is a strong predictor of election outcomes. These hypotheses, in their theoretical assumptions, also admit that efficiencies gained through the integration of markets for trade and investment are key to securing economic growth in the future, and, finally, they recognize the diverse impact that integration will have on labour markets in many countries. However, there remain clear divergences in the political and economic consequences. A negative relationship can be expected between trade openness and government spending, according to the ***efficiency hypothesis***. Following the ***compensation*** argument, provided that openness does increase exposure to external risk and governments do discharge the risk-mitigating role, we ought to find a positive causal relationship between trade-openness and government size. In this sequence, the ***deindustrialisation hypothesis*** may be observed as the null hypothesis of the other two, suggesting that there are no direct causal relationships between globalization and the welfare state.

There are four remaining sections to this paper. The next section reviews the globalization-welfare state debate as well as the Portuguese basic evidence with respect to trade openness and public expenditures. The third section clarifies this paper's empirical framework. The final section concludes. The appendix contains details of the variables employed in this paper as well as more comprehensive empirical results.

2 Trade openness and government size: hypotheses, findings, and Portuguese stylized facts

2.1 The basic evidence and the theoretical hypotheses

From the Great Depression until the 1970s, it may have been possible for government to expand the public economy at little expense, due to the closed pattern of the international economy. However, nowadays researchers identify a clear trade-off between efficiency and welfare, which promotes the need for a serious reflection on the role of openness, the governments' responses and the changing composition of government outlays.

Two major trends characterised the post World War II period, namely the process of international economic integration and the expansion of government sectors both in industrialised and in developing countries and, particularly in the former, the increasing role of the public authority as the main provider of social insurance.

However, Tanzi (2006) compared 13 of the most open industrial countries with respect to public spending at its highest as a share of GDP and its level in 2002 and he shows that government expenditures are stagnant or declining, although economic openness clearly continues to be high.

A wide literature addresses this interaction between globalization, domestic politics, and government spending, from the seminal works of Cameron (1978) and Katzenstein (1985) to some recent and influential works signed by Garrett and Nickerson (2001) and Adsera and Boix (2002).

There are three main set of hypotheses in this globalization problem: the efficiency hypothesis, the compensation hypothesis and the deindustrialisation hypothesis. These hypotheses acknowledge that economic growth serves the interests of virtually all citizens and is a strong predictor of election outcomes. These hypotheses also admit, as additional assumption, that efficiencies gained through the integration of markets for trade and investment are a key to securing economic growth in the future, and, finally, they recognize the diverse impact that integration will have on labour markets in many countries. However, there remain clear divergences among their political and economic consequences.

The efficiency hypothesis highlights the market competitive forces role, generating lobbying pressures and coercions of exit by asset holders (Garrett, 2001).

The basic principle of the efficiency hypothesis is that government spending beyond minimal market-friendly proceedings reduces the competitiveness of local producers in international goods and service markets. Government outlays should be financed, firstly by short term borrowing and ultimately by higher taxes. In spite of the variability of public revenue composition, especially the tax revenue, there is erosion of personal assets when government mainly resorts to taxes on income and wealth, which depresses investment, promotes an appreciation in the real exchange rate and a decrease in national global competitiveness.

Alesina and Perotti (1997) also argue in this sense: since public expenditure and the taxation necessary to finance it damage the international competitiveness of national firms and industries and since the threat of international relocation of increasingly mobile capital, firms and jobs undermines the revenue raising ability of governments.

Therefore, a negative relationship between trade openness and government spending can be expected, according to the ***efficiency hypothesis***.

The compensation hypothesis accentuates the local movement generated by globalization and puts emphasis on the incentives for government interventions in the economy in order to protect national economic agents.

Some authors, like Ruggie (1982), Garrett (1998a) or Rodrik (1997) recognize that there persist political incentives to expand the public economy in response to globalization that may counterbalance the competitiveness pressures consequent on market integration. For instances, the effect of trade is likely to be more signalled by inequality than insecurity in the OECD countries, with the reverse being observed in the developing countries.

According to Hecksher-Ohlin models, expanding trade may reduce demand for relatively scarce factors of production and increase demand for plentiful ones, generating inequality in OECD members but more equality in the developing world, as stated by Wood (1994). As a result, trade growth is unlikely to increase economic insecurity in developed countries but it is likely to bring economic inequality to these countries.

But, according to Rehm (2005)[1], the two forces (the ***efficiency hypothesis*** and the ***compensation hypothesis***) can counterbalance each other, in which case empirical results would show no significant associations between globalization and the size of government – the ***deindustrialisation hypothesis***.

In this sequence, the deindustrialisation hypothesis may be observed as the null hypothesis of the other two. Iversen and Cusack (2000) argue that there is no direct causal relationship between globalization and the welfare state. According to them, deindustrialisation explains the expansion of the welfare state, also following Wagner (1883), Galbraith (1952), or Thornton (1998).

2.2 Previous findings

In his influential contribution, Rodrik (1997) used cross-country data to investigate the nature of the relationship between "trade-openness" and "government size", calculated, respectively, by (imports+exports)/GDP averaged over the period 1980-1989 and government consumption/GDP averaged over a different period (1990-1992). Rodrik (1997) found that there is a strong positive causation from the former to the latter, stating that there may be a degree of complementary between markets and governments.

Obviously, these findings of Rodrik (1997) strengthened the re-discovered ***compensation hypothesis*** – the increased instability brought about by growing contact to developments around the world generates incentives for governments to provide social insurance against economic displacements and their national social costs.

However, Garrett (2001) states that the relationship between trade-openness and government size should be considered a process, not a steady-state function, allowing a deep distinction between the short-run and the long-run relationship of these dimensions. Using cross-country data, Garrett (2001) compares the results of regressions based on levels with those based on changes. His results confirm the importance of this distinction: whilst the regressions based on levels support the ***compensation hypothesis*** (more open countries exhibit larger governments), those based on changes point out that government dimension developed less quickly in those countries in which trade-openness increased faster.

Other correlated results were obtained by Bretschger and Hettich (2002), Dreher and Gaston (2005), or Dreher (2006).

Bretschger and Hettich (2002) used a novel measure of openness which corrects for country size and find that globalization has a negative and significant force on corporate income taxes and tends to elevate certain taxes. On the other hand they also find that globalization increases social outlays. As a consequence, efficiency has an impact on the tax composition, whereas compensation is present through increases in social outlays.

Rudra (2002) observed that protective welfare benefits under the forces of globalization is much easier in OECD countries than in developing ones where employees are not

[1] An anonymous referee of the *Financial Theory and Practice* argues that there is an alternative lecture of the deindustrialisation hypothesis, stating that neither of the two main hypotheses (Efficiency or Compensation) should be acting when the deindustrialisation hypothesis prevails.

as well organized, pointing to the crucial role of the characterization of the political regime and of the demand side of the political market.

Dreher and Gaston (2005) found that globalization promoted deunionization and Dreher (2006) investigated the impact of various dimensions of globalization on the tax mix and government expenditures and, surprisingly, none of the three dimensions of globalization (economic, political, and social) appeared to have a significant impact.

Speaking from a general point of view, Tanzi (2006) states that there is more evidence to support the efficiency hypothesis. According to his lecture, the level of public spending did not grow during 1870-1913, when economies were particularly open. The political and intellectual winds that led to the expansion of government and produced the welfare state have been long in coming and became strong in the years when economies became less open. Therefore, the New Deal and the Keynesian revolution were late products of the Great Depression. And by the early 1950s, there was already support for the creation of welfare states in today's developed countries. Using a comparison for 13 of the most open industrial countries, Tanzi (2006) observed that the more open the economies became, the greater the downward pressure on spending and he clearly shows that the link between economic openness and public spending varies across periods and countries.

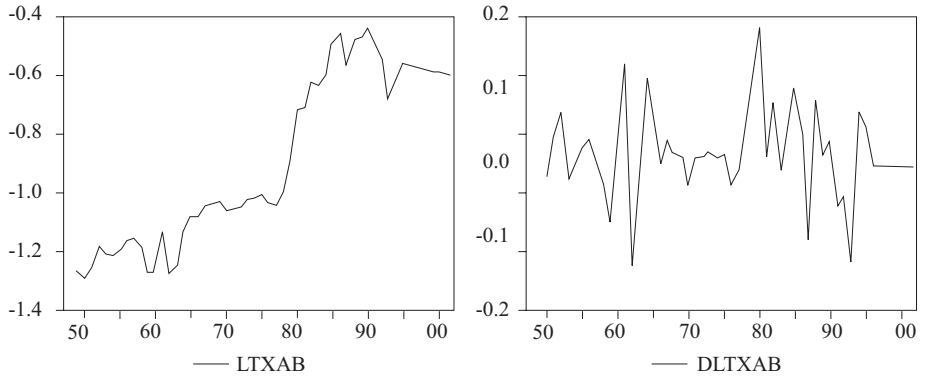
2.3 Portugal, Trade Openness and Public Finances

Now, we will focus on the recent Portuguese experience of globalization, its trade openness and the basic figures derived from the evolution of the main national public expenditures.

Observing Figure 2.1, we state that the (logs of) Portuguese openness (measured as the proportion between the sum of national imports with exports and GDP) has increased since almost the end of World War II, graphically suggesting an "S" line (low growth rates at the beginning and at the end and high growth rates at the middle of the range of the observations). The growth rates (Figure 2.1) also suggest that there were different rhythms in this period: the years in which this variable most increased were those between 1960 and 1980. After the 1980s, the rhythm decreased, regardless of the increasing values of the series levels. The sources of these variables are described in Table 3.1.

According to Afonso and Aguiar (2004), Portugal had significant incentives that supported a globalization effort since 1960. The entry in the European Free Trade Area (EFTA), in 1960, started the newest attempt of the Portuguese economy to increase its trade with other international areas, in this case, with European partners. After 1960, an increase of the foreign direct investment receipts was also registered and a rise in the national labour productivity due to emigration to France, Germany and Switzerland (in Europe) and Brazil and the United States of America (in the Atlantic space). This migratory flow almost immediately produced increases in productivity which led to a significant entry of financial resources that helped to support the acquisition of many imports related to the modernization of all economic sectors, as observed by Lopes (1996). After the 1980s, Portugal left EFTA and entered the European Economic Community (EEC). In spite of the persistence of the upward movement in trade openness (due to a largely expanded market), the previous high growth rates were not repeated, not only because of the "sta-

Figure 2.1 Portuguese trade openness $\left(\frac{imports + exports}{GDP}\right)$*, logs, and its first differences, 1947-2002*



Legend – LTXAB: Trade Openness; DLTXAB: Trade Openness annual growth rates
Source: Mourão (2006)

tistical effect" observed in the first times but also because of the greater incidence of the management of the composition of the export and import baskets (to the detriment of the volume *per se*), as Afonso and Aguiar (2004) also demonstrated in their analysis.

Andersen and Herbertsson (2003) corroborate this finding related to the last two decades of Portuguese trade. They concluded that there were notable improvements in the (openness) ranking for European countries like Finland, Italy, Portugal, Spain, and Sweden. For Portugal and Spain the changes seem to follow EU membership in the mid 1980', evidencing a slower evolution if compared with previous values.

Now, we will turn our focus to the main Portuguese public expenditures, in the same period (1960-2002).

Portuguese public expenditures reveal a notable growth until the beginnings of the 1980s. Since this period, the evolution has not been characterized by such significant rates. Until 1980, the average growth rate of this macroeconomic aggregate was 9.2%. Since then, the average growth rate has rounded at the value of 8.8%. As a proportion of real GNP, Portuguese real public expenditures grew from 13% (of 1947) to 42% (of nowadays)[2]. The graphs of the series analyzed in this work can be observed in Figures 2.2 and 2.3 (at the Annex). The sources of these variables are described in Table 3.1.

But Figures 2.2 and 2.3 also exhibit the components of the public expenditure. Looking at this large set of outlays, we can visually detect that the generality of the series shows a more relevant growth until the beginning of the 1980s. After this period, the growth rates are characterized by lower values. The exceptions are related to interest payments (with maximums during the 1970s, stabilizing afterwards), and to subsidies (with an irregular pattern, combining periods of growth, like those between 1960 and 1980 or between 1995 and 2002, with periods of reduction, like that between 1980 and 1995).

[2] These values can be confirmed in Mourão (2006).

Trying to group these expenditures according to their series patterns, we can find three groups. The first group is composed of current expenditures, public consumption, wages and current transfers outlays. These expenditures had, respectively, the following average growth rates until 1980s: 9.2%, 8.2%, 6.3%, and 7.2%. After the 1980s, the average growth rates were 8.8%, 6.3%, 5.7%, and 4.2%. The second group is composed of other current expenditures, capital expenditures, expenditures on gross formation of fixed capital and land acquisition, and capital transfers. In this group, there is predominance of positive growth rates, although their movements are notoriously more irregular around 1980. The third group is composed by expenditures on interest payments and expenditures on subsidies, mixing positive and negative growth rates in a more balanced way.

Observing Figures 2.1, 2.2 and 2.3 together, we have the perception that there may be a co-movement between Portuguese trade openness and the Portuguese public expenditures. The following sections will contribute to the investigation of this relationship and to bear out the hypothesis that - *Efficiency (Trade reduces expenditures)/Compensation (Trade increases expenditures)/Deindustrialization (Trade and Public Expenditures are independent)* - prevails for each Portuguese public outlay since 1960.

3 Econometric Model, Data and Results

Our model follows Kirchgassner and Pommerehne (1997) and Mourao (2006). Firstly, each public expenditure q_{it} will be deflated by its proper deflator, *LDqit,* according to Beck (1981) and to Tridimas (1992).

In a first stage, there will be an evaluation of whether there is homogeneity between the real product, *LPIBt-LDPIBt,* and each real expenditure, *qit-LDqit,* also considering the significant control variables, z_{jt}, and our main regressor, *LTXAB,* the indicator of the trade openness. This suggestion is represented in Eq. 3.1:

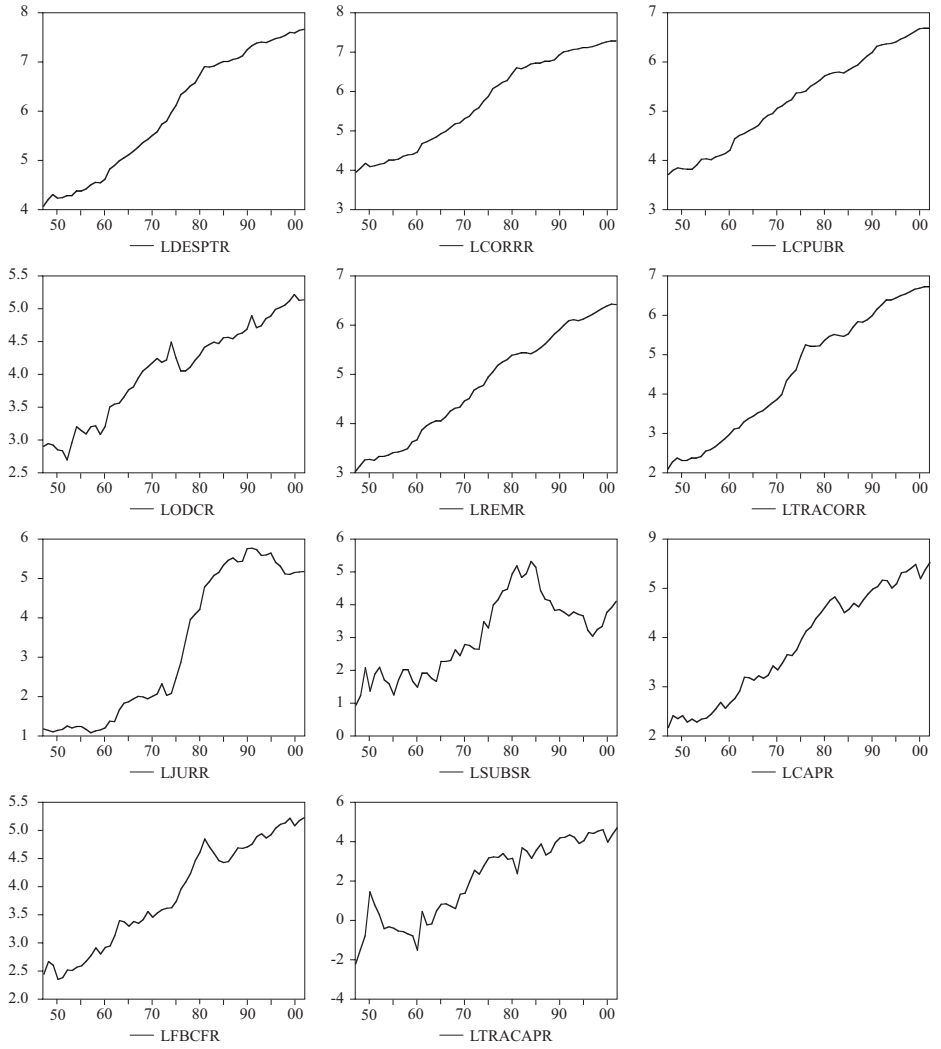
$$q_{it} - LDq_{it} = \alpha + \beta * (LPIB_t - LDPIB_t) + \gamma * LTXAB_t + \sum_{j=1}^{k} \delta_{q_i,j} * z_{j_t} + u_t \qquad (1)$$

If we can not reject the null hypothesis $\beta = 1$ for a certain q_{it} then the previous equation should be modified into Eq. 2:

$$[(q_{it} - LDq_{it}) - (LPIB_t - LDPIB_t)] = \alpha + \gamma * LTXAB_t + \sum_{j=1}^{k} \delta_{q_i,j} * z_{j_t} + u_t \qquad (2)$$

The interpretation for each estimated coefficient varies slightly, depending on the chosen equation (Eq. 3.1 or Eq. 3.2). The former case returns estimates for the effects promoted by each determinant on the fiscal series levels. The latter case returns estimates for the effects promoted by each determinant on the fiscal series, now as a proportion of the real product. Given the log-linearization process, these estimates are identified with the elasticities of the public expenditures.

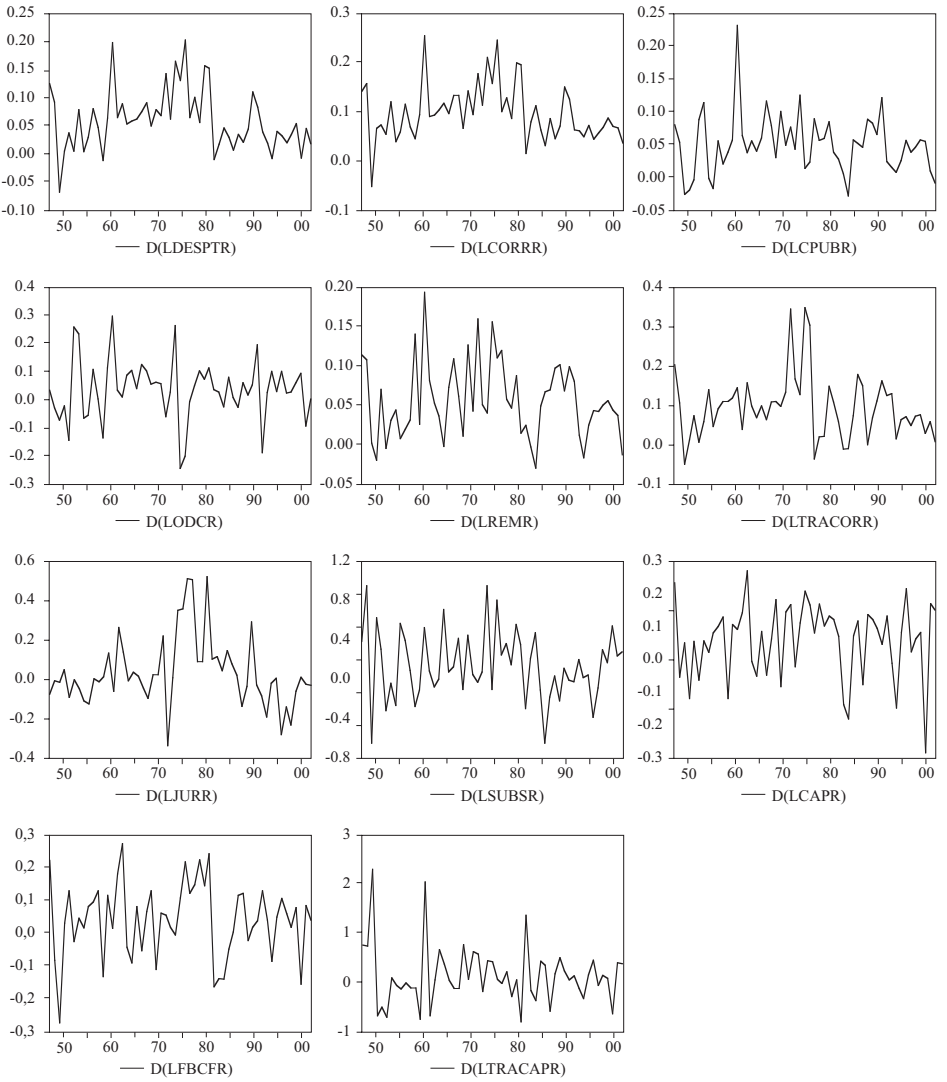
Figure 2.2 Portuguese real public expenditures (logs), 1947-2002



Legend - LDESPTR: Aggregate Expenditures; LCORRR: Current Exp.; LCPUBR: Public Consumption Exp.; LODCR: Other Current Exp.; LREMR: Exp. on Wages ; LTRACORR: Current Transfers Exp.; LJURR: Exp. on Interests; LSUBSR: Subsidies; LCAPR: Capital Exp.; LFBCFR: Fixed-Capital Formation and Land Acquisition; LTRACAPR: Capital Transfers Exp.

Source: Mourão (2006)

Figure 2.3 First differences of Portuguese real public expenditures (logs), 1947-2002



Legend – D(LDESPTR): Aggregate Expenditures annual growth rates; D(LCORRR): Current Exp. annual growth rates; D(LCPUBR): Public Consumption Exp. annual growth rates; D(LODCR): Other Current Exp. annual growth rates; D(LREMR): Exp. on Wages annual growth rates; D(LTRACORR): Current Transfers Exp. annual growth rates; D(LJURR): Exp. on Interests annual growth rates; D(LSUBSR): Subsidies annual growth rates; D(LCAPR): Capital Exp. annual growth rates; D(LFBCFR): Fixed Capital Formation and Land Acquisition annual growth rates; D(LTRACAPR): Capital Transfers Exp annual growth rates.

Source: Mourão (2006)

This study focused on the most detailed available panel of Portuguese public expenditures, provided by the national Central Bank (the "Banco de Portugal"). These expenditures and their short designations are as follows - LDESPTR: aggregate expenditures; LCORRR: current expenditures; LCPUBR: public consumption expenditures; LODCR: other current expenditures; LREMR: expenditures on wages; LTRACORR: current transfers expenditures; LJURR: expenditures on interests; LSUBSR: subsidies; LCAPR: capital expenditures; LFBCFR: fixed capital formation and land acquisition; LTRACAPR: capital transfers expenditures.

Besides our main focused explanatory variable, LTXAB, we also used a large set of control variables, suggested by the public finances literature, as possible determinants of the public expenditures growth[3]: number of unemployed[4] *(LDESEMP)*, real gross domestic product[5] *(LPIBR)*, total public revenues[6] *(LREC)*, number of public employees[7] *(LFUN)*, rate of openness[8] *(LTXAB)*, proportion between the direct and the indirect taxes[9] *(LDIR)*, proportion between the local and the total public revenues[10] *(LLOC)*, proportion of Portuguese residents older than 65[11] *(LIDOS)*, municipal electoral years[12] (dummy, *AUTARQ*), legislative electoral years[13] (dummy, *AREP*), years characterized by a parliamentary majority of "left" parties[14] (dummy, *COR*) and real current transfers *per capita*[15] (*LTRACORP*).

These data, not surprisingly, form a time-series data set in which each year represents a single observation of each variable. The sources of these variables are described in Table 3.1.

In a following task, it is needed to characterize the integration level of each variable. For this purpose, I firstly used the popular Augmented Dickey-Fuller (ADF) test. For discussing the preferred number of lags in each regression of the test, the Schwarz Information Criteria were used. The results suggest that the series *LREC* and *LIDOS* are I(2) while all the others are I(1).

According to Elliott, Rothenberg and Stock (1996), the Augmented Dickey-Fuller test can reveal serious problems if there is a short sample of observations. In order to surmo-

[3] For a detailed discussion about the Theories of the Public Expenditures growth, see Mourao (2006).

[4] According to (AT), Frey and Schneider (1981).

[5] AT Wagner (1883) or Bird (1971).

[6] AT Wildavsky (1964).

[7] AT Buchanan and Tullock (1962) or Cameron (1978).

[8] AT Cameron (1978).

[9] AT Buchanan and Wagner (1977).

[10] AT Brennan and Buchanan (1977).

[11] AT Wagner (1883) or Bird (1971).

[12] AT Frey and Schneider (1978).

[13] AT Frey and Schneider (1978).

[14] AT Cameron (1978) or Castles (1982).

[15] AT Downs (1957) or Meltzer and Richard (1981).

unt this limitation, I tested the presence of unit-roots in all the variables. The results were convergent with those achieved with the ADF.

I also found the previous suggestion using the Leybourne and McCabe (1994) test: all the series are I(1), except ***LREC*** and ***LIDOS***. Finally, for confirming the existence of double unit-roots, I used the Dickey-Pantula (1987) test – this test also recognized the earlier proposals.

Tables 4.1 and 4.2 synthesize these findings.

After these proceedings, the regressions were initially estimated by Static Ordinary Least Squares. As stated by Krolzig and Hendry (2001), some of the variables might not be characterized by significant coefficients. Consequently, a second estimation was obtained, now omitting the non-significant variables.

Table 4.2 Dickey-Pantula test on the most probable I(2) series

y_t	$\hat{\theta}_2/\sigma_{\theta_2}$	$\hat{\theta}_3/\sigma_{\theta_3}$
LREC	-0.934	-10.857***
LIDOS	-1.313	-8.333***

*Notes: *,** and *** identify the significance level when the Null Hypothesis is rejected by 10%, 5% and 1%.*

Source: Author's comutation on the basis of the sources in Table D1

Since there were only I(1) variables in this phase, the null hypothesis of no-cointegration was then evaluated using Engle-Granger-type tests with MacKinnon (1996) tables. Observing the results (Table 4.3) we can suspect that there are long-term relations between the (log of the) openness rate and the (logs of the) the real expenditures on subsidies, the other current expenditures, and the real expenditures on interest. All the significant coefficients of LTXAB from these regressions are positive. Therefore, the ***compensation hypothesis*** seems to prevail in the pointed outlays.

After this step, it was registered that the coefficient associated to the (logs of the) real gross domestic product (GDP) had, statistically, a value around "1", in some of the regressions. Then, according to these results, we can accept the hypothesis of the homogeneity of the product, which promotes new estimations using some of the previous variables as ratios of the real GDP. Table 4.4 expresses the results from this last set of estimations.

Now, we also observe that there is an additional long-term relation, that between the (log of the) openness rate and the (log of the) the real total public expenditures.

For building the intervals of values containing efficient estimations, I followed the suggestion of Stock and Watson (1993). According to this suggestion, the researcher has to make use of the Dynamic Ordinary Least Squares (DOLS) and to the Non-linear Least Squares (NLS) estimations. According to Stock and Watson (1993), this procedure produces a range of values (from the lowest to the highest values of the set of the estimation methods) that avoids some usual estimation errors, which can be the result, for example, of structural breaks not easily identifiable. Synthesizing the findings, Table 4.5 shows the

range of values of the estimated elasticities, omitting the cases where the intervals had a negative value as the lowest boundary and simultaneously a positive value as the highest boundary (which could be associated to non-significant true coefficients).

Still, we feel that our specification of a long-run relationship suggests that an increasing Portuguese openness rate might have promoted a rise in public expenditures in the analyzed period. It is also consistent with the claim that suggested this pressure was mainly motivated by governmental attempts at protecting local agents, by increasing subsidies, for instances.

Suggesting an economically intuitive interpretation of the results, we can point out that an increase of 1% in the openness rate raised the size of real total public expenditures in real GDP between 5 and 12 %[16]. The same impulse promoted a rise between 1.7 and 2.9 % in the share of public subsidies. The other current expenditures and the expenditures on interest payments increased in levels due to the increasing Portuguese openness, with the respective maximum responses 0.6 and 3.5, following the results from Dreher, Sturm and Ursprung (2006).

According to Engle and Granger (1987), after long-run cointegrated equations are estimated, an error correction model (ECM) is estimated to study short-run dynamics between the variables. The estimation of an ECM returns the proportion of the correction of the short-term deviations (λ) related to a long-term value of equilibrium. Taking the equation 3.1 or the equation 3.2, their ECM can respectively be suggested by the equation 3.3 or 3.4:

$$\Delta(q_{it} - LDq_{it}) = \alpha + \beta * \Delta(LPIB_t - LDPIB_t) + \gamma * \Delta LTXAB_t + \sum_{j=1}^{k} \delta_{q_i,j} * \Delta z_{j_t} + \lambda * u_{t-1} + z_t \qquad (3)$$

$$\Delta[(q_{it} - LDq_{it}) - (LPIB_t - LDPIB_t)] = \alpha + \gamma * \Delta LTXAB_t + \sum_{j=1}^{k} \delta_{q_i,j} * \Delta z_{j_t} + \lambda * u_{t-1} + z_t \qquad (4)$$

Following Hendry (1995), the researcher has to include a previous large number of lags of the regressors (z_j) in the ECM equation and, gradually, he has to eliminate the least significant, observing criteria like those of Schwarz Information.

Table 4.6 shows the results reached for each regressand of the previous estimations.

Commenting on the results from Table 4.6, we observe that all the estimated λ are negative and significant. The annual correction of any disturbance oscillates between the 24.5% in the size of real current transfers[17] and the 69.5% in the size of real current expenditures[18],[19], leading to the conclusion that there is a larger slowness related to some (expected) outlays, mainly constituted by major obligations of the State (payment of wages to public workers, unilateral grants with redistributive aims and the public investment).

[16] Observe that we are stating that the size of the real total public expenditures may rise from 5% to 12 %, not claiming that the size may rise from 5 to 12 percentage points. Concretely, if the size grows from 27% to 27.2% then it has risen around 0.74% (the focused elasticity) or it has risen 0.27 percentage points.

[17] [(LCORR-LDDESP)-(LPIB-LDPIB)]

[18] [(LCORR-LDDESP)-(LPIB-LDPIB)].

Focusing on the trade variable, another interesting result is derived from the lack of significance of the coefficients associated to the (growth[20] of the) number of public employees, LFUN, or to the variables LLOC (proportion between the local and the total public revenues) and LTRACORP, real current transfers *per capita* (in the ECM of the proportion of the aggregate public expenditures in GNP (column 11 of the results). This result, following Gemmell, Morrissey and Pinar (1998), recognizes that the variables related to the (growth of) unemployment, the globalization of the economy or to the fiscal illusion hypothesis are more interesting to explain the found annual growth rates of the proportion of real total public expenditures in the real GNP.

LTXAB, the rate of openness, loses significance in the ECM equation of the interest payment but it maintains its statistical significance in the other three equations where we have already noticed it (other current expenditures, subsidies and aggregate expenditures as a GDP proportion). We also observe that the direction of the effects is the same: even in the short-run, trade openness mainly increases some Portuguese (current) expenditures.

The non-rejection of the null hypotheses of the four specification tests for most of the residuals of the equations (normality of the residual series, Breusch-Godfrey test with 4 lags, ARCH with 4 lags and test for the heteroskedasticity) show that there are no relevant specification problems in the estimated ECM.

4 Conclusion

In this paper, we mainly examined the *composition* of Portuguese public expenditures rather than the overall level. Economic theory suggests different varieties of government expenditures react differently to trade openness.

According to the *efficiency* hypothesis, globalization restrains governments by generating increased budgetary pressure. The compensation effect, on the other hand, is expected to lead to a more significant share of social expenditures. However, these two forces (those supported by the *efficiency hypothesis* and by the *compensation hypothesis*) can counterbalance each other, in which cases empirical results would show no significant links between globalization and the size of government – the *deindustrialisation hypothesis*.

The analysis carried out in this paper fails to provide an overwhelming support for a positive causality from international trade openness to the size of all Portuguese government expenditures. A conclusion that can be drawn from these results is a rejection of the universal validity of the hypotheses. Alternatively, these findings could simply be taken to suggest that *trade* openness is not the main force driving the growth in the size of all public outlays but it really does influence (in the case, it does increase) the size of some pointed spendings (Total expenditures as a GDP share, other current expenditures, and subsidies). The nature of these expenditures suggests that, for the Portuguese case, what has

[19] As expected, the estimated correction for the share of real expenditures in the product [(LDESPT-LDDESP)-(LPIB-LDPIB)] (52.7%) reflects the weighted values of the estimated corrections for the components of the aggregate public expenditures (current and capital spending).

[20] The first difference of the log values of a series is rather close to the growth rate between the original values of those observations, using a Taylor series approximation.

been observed is the particular validity of the *compensation hypothesis* to the detriment of the *efficiency hypothesis* (not one of the estimated coefficients for the public outlays has been characterized by a negative sign). These expenditures react to the increasing size of trade openness (as observed in the cointegration equations) but their growth rates also react to the growth rates of trade openness (as noticed in the ECM estimations).

Interestingly, these results combine the expected evidence from the works of Rodrik (1997) and the challenger Garrett (2001) for a national case. Besides a long-term relation between (some) public expenditures and trade openness, there may appear short-term relations between them. Therefore, the complexity of globalization related to trade openness is again recognized: globalization is not only a steady-state function, globalization is not only a short-term process – globalization joins these characteristics into mixed functions that deserve further explorations.

LITERATURE

Adsera, A. and Boix, C., 2002. "Trade, Democracy, and the Size of the Public Sector: The Political Underpinnings of Openness". ***International Organization,*** 56 (2), 229-262.

Afonso, O. and Aguiar, A., 2004. "Comércio externo e crescimento da economia portuguesa no século XX". ***CEMPRE Working Papers,*** No. 146. Porto: Faculdade de Economia da Universidade do Porto.

Alesina, A. and Perotti, R., 1997. "The Welfare State and Competitiveness". ***American Economic Review,*** 87, 921-939.

Andersen, T. and Herbertsson, T., 2003. "Measuring Globalization". ***IZA Discussion Paper***, No**.** 817. Bonn: IZA.

Andrade, J., 2000. ***Un essaie d.application de la théorie quantitative de la monnaie à l.économie portugaise, 1854-1998*** [online]. Mimeo. Avaiilable from [http://www2.fe.uc.pt/~jasa/estudos/Tqm.PDF].

Beck, M., 1981. ***Government spending: trends and issues***. Westport: Greenwood Press.

Bird, R., 1971. "Wagner's law of expanding state activiy". ***Public Finance,*** 26, 1-26.

Brennan, G. and Buchanan, J., 1977. „Towards a Tax Constitution for Leviathan". ***Journal of Public Economics,*** 8, 255-274.

Bretschger, L. and Hettich, F., 2002. "Globalization, capital mobility and tax competition: theory and evidence for OECD countries". ***European Journal of Political Economy,*** 18, 695-716.

Buchanan, J. and Tullock, G., 1962. ***The Calculus of Consent.*** Michigan: University of Michigan Press.

Buchanan, J. and Wagner, R., 1977. ***Democracy in deficit: the political legacy of Lord Keynes.*** New York: Academic Press, Inc.

Cameron, D., 1978. „The Expansion of the Public Economy: A Comparative Analysis". ***American Political Science Review***, 72, 1243-1261.

Castles, F. (ed.), 1982. ***The impact of parties: politics and policies in democratic capitalist state.*** Beverly Hills: Sage.

Comissão Nacional de Eleições – CNE (several years). ***Resultados Eleitorais*** [online]. Available from: [http://eleicoes.cne.pt/resultados5.html].

DGO - Direcção Geral do Orçamento (several years). ***Conta Geral do Estado – CGE. Lisboa:*** Ministério das Finanças de Portugal.

Dickey, D. and Pantula, S., 1987. "Determining the Order of Differencing in AR Processes***". Journal of Business and Economic Statistics,*** 5, 455-461.

Downs, A., 1957. ***An Economic Theory of Democracy***. New York: Harper and Row.

Dreher, A. and Gaston, N., 2005. "Has Globalization Really Had No Effect on Unions?" ***KOF Working Paper,*** No. 110. Zurich: ETH.

Dreher, A., 2006. "The Influence of Globalization on Taxes and Social Policy – an Empirical Analysis for OECD Countries". ***European Journal of Political Economy***; 22, 1, 179-201.

Dreher, A., Sturm, J. and Ursprung, H., 2006. "The Impact of Globalization on the Composition of Government Expenditures: Evidence from Panel Data". ***KOF Working Paper,*** No. 141. Zurich: Konjunkturforschungsstelle Swiss Institute for Business Cycle Research.

Elliott, G., Rothenberg, T. and Stock, J., 1996. "Efficient tests for an autoregressive unit root"; ***Econometrica***, 64, 813-836.

Engle, R. and Granger, C., 1987. "Co-integration and Error correction: representat ion,estimation and testing". ***Econometrica,*** 35, 251-276.

Frey, B. and Schneider, F., 1981. "A Politico-Economic Model of the U.K.: New Estimates and Predictions". ***The Economic Journal,*** 91 (363), 737-740

Galbraith, J., 1952. ***American Capitalism: The Concept of Countervailing Power***. Boston: Houghton Mifflin.

Garrett, G. and Nickerson, D., 2001. ***Globalization, Democratization and Government Spending in Middle Income Countries***. Los Angeles: University of California.

Garrett, G., 1998. ***Partisan Politics in the Global Economiy.*** Cambridge, MA; Cambridge University Press.

Garrett, G., 2001. "Globalization and Government Spending Around the World". ***Studies in Comparative International Development,*** 35 (4), 3-29.

GEE, 2004. ***Séries do Índice de Preços para o Total de Produtos, do PIB, do Número de Desempregados, das Exportações, das Importações, dos Défices e das Dívidas da Administração Pública (1984-2002).*** Lisboa: Gabinete de Estratégia e de Estudos do Ministério da Economia de Portugal.

Gemmell, N., Morrissey, O. and Pinar, A., 1998. "Taxation, Fiscal Illusion and the demand for government expenditures in the UK: a time-series analysis". ***University of Nottingham School of Economics Discussion Paper,*** No. 98/10.

Hendry, D., 1995. ***Dynamic Econometrics.*** Oxford: Oxford University Press.

IEFP (several years). ***Relatórios anuais do Mercado do Emprego.*** Lisboa: Instituto do Emprego e Formação Profissional.

Instituto Nacional de Estatística, 2004. ***Série para a População Residente em Portugal – Total e Classes etárias*** [online]. Available from: [http://www.ine.pt/prodserv/nseries/dado.asp].

Iversen, T. and Cusack, T., 2000. "The Causes of Welfare State Expansion: Desindustrialization or Globalization?". ***World Politics,*** 52, 313-349.

Katzenstein, P., 1985. ***Small States in World Markets. Industrial Policy in Europe***. Ithaca and London: Cornell University Press.

Kirchgässner, G. and Pommerehne, W., 1997. „Public Spending in federal states" in P. Capros and D. Meulders, eds. ***Budgetary Policy Modelling – Public Expenditures.*** London: Routledge, 179-213.

Krolzig, H. and Hendry, D., 2001. "Computer automation of general-to-specific model selection procedures***". Journal of Economic Dynamics and Control,*** 25, 831-866.

Leybourne, S. and McCabe, B., 1994. "A Simple Test for Cointegration". ***Oxford Bulletin of Economics and Statistics,*** 56 (1), 97-103

Lopes, J., 1996. ***A Economia Portuguesa desde 1960***. Lisboa: Gradiva.

MacKinnon, J., 1996. "Numerical distribution functions for unit root and cointegration tests". ***Journal of Applied Econometrics***; 11, 601-618.

Meltzer, A. and Richard, S., 1981. "A Rational Theory of the Size of Government***". Journal of Political Economy,*** 89 (51), 914-927.

Mourao, P., 2006. ***Determinantes da Despesa Pública em Portugal***. Porto: Caixotim.

Neves, J., 1994. ***The Portuguese Economy: a Picture in figures***. Lisboa: Universidade Católica Editora.

Neves, J., 1996. "Portuguese Postwar Growth: a global approach" in N. Crafts and G. Toniolo, eds. ***Economic Growth in Europe since 1945.*** Cambridge: Cambridge University Press, 329.353.

Pinheiro, M. (coord.), 1997. ***Séries Longas para a Economia Portuguesa***, ***Vol. I***. Lisboa: Séries Estatísticas do Banco de Portugal.

Rehm, P., 2005. "Citizen Support for the Welfare State: Determinants of Preferences for Income Redistribution". ***Discussion Paper,*** No. SP II 2005-02**.**

Rodrik, D., 1997. ***Has Globalization Gone Too Far?*** Washington, DC: Institute for International Economics.

Rodrik, D., 1998. "Why do more open economies have bigger governments?". ***Journal of Political Economy***, 106 (5), 997-1032.

Rudra, N., 2002. "Globalization and the Decline of the Welfare State in Less Developed Countries". ***International Organization,*** 56, 411-445.

Ruggie, J., 1982. "International Regimes, Transactions and Change: Embedded Liberalism in the Postwar Economic Order". ***International Organization,*** 36, 379-416.

Stock, J. and Watson, W., 1993. "A simple estimator of cointegrating vectors in higher order integrated systems". ***Econometrica,*** 61 (4), 783-820.

Tanzi, V., 2006. "Making Policy under Efficiency Pressures: Globalization, Public spending, and social Welfare" in I. Kaul and P. Conceição, 2006. ***The New Public Finance***. Oxford: Oxford University Press.

Thornton, J., 1998. "The growth of public expenditure in Latin America: a test of Wagner's Law". ***Cuadernos de Economía,*** 105, 255-263.

Tridimas, G., 1992. "Budgetary deficits and government expenditures growth: towards a more accurate empirical specifications". ***Public Finance Quarterly***, 20, 275-297.

Valério, N., Nunes, A. and Mata, E., 1989. „Portuguese economic growth 1833-1985". ***The Journal of European Economic History***, 18; 191-230.

Wagner, A., 1883. „Three Extracts on Public Finance" in R. Musgrave and A. Peacock, eds. ***Classics in the Theory of Public Financ***e. London: Macmillan.

Wildavsky, A., 1964. ***The Politics of the Budgetary Process***. Boston; Toronto: Little, Brown and Company.

Wood, A., 1994. ***North-South Trade, Employment and Inequality***. New York: Oxford University Press.

Appendix

Table 3.1 Variables, Designations and Sources

Variables	Designations	Sources	Expected sign
Real Current Exp. (log)	LCORR-LDDESP	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years);	Endogenous
Real Public Consumption (log)	LCPUB-LDCPU	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Remunerações reais (log)	LREM-LDCPU	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Other real Current Exp. (log)	LODC-LDCPU	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Real Exp. On Interests payments (log)	LJUR-LDCPRIV	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Real Subsidies (log)	LSUBS-LDDESP	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Real Current Transfers (log)	LTRACOR-LDCPRIV	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Real Capital Exp. (log)	LCAP-LDDESP	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Gross Fixed-Capital Formation and Acquisition of Lands (log)	LFBCF-LDDESP	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Real Capital Transfers (log)	LTRACAP-LDCPRIV	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Aggregate real Public Exp. (log)	LDESPT-LDDESP	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Endogenous
Number of Unemployed (log)	LDESEMP	1947 a 1995: Pinheiro (1997); 1996 a 2002: GEE	Positive
Real GDP (log)	LPIB-LDPIB	1947 a 1953: Andrade (2000); 1954 a 1995: Pinheiro (1997); 1996 a 2002: GEE	Positive
Aggregate Public Revenues (log)	LREC	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Positive
Number of Public Employees (log)	LFUN	1947 a 1989: Neves (1994); 1990 a 2002: IEFP	Positive
Trade Openness (log)	LTXAB	1947 a 1995: Pinheiro (1997); 1996 a 2002: GEE	Positive (compensation hyp.) / Negative (efficiency hyp.)
Proportion between the direct and the indirect taxes (log)	LDIR	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Positive
Proportion between the local and the total public revenues (log)	LLOC	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years)	Negative
Proportion of Portuguese residents older than 65 years (log)	LIDOS	1947 a 2002: INE	Positive
Municipal electoral years (dummy)	AUTARQ	1947 a 2002: CNE	Positive
Parliamentary electoral years (dummy)	AREP	1947 a 2002: CNE	Positive
Years characterized by a parliamentary majority of "left" parties (dummy)	COR	1947 a 2002: CNE	Positive
Real Current Transfers *per capita*	LTRACORP	1947 a 1995: Pinheiro (1997); 1996 a 2002: CGE (several years): 1947 a 2002: INE	Positive

Note: LDPIB - (log) Deflator of the Gross National Product; LDCPRIV - (log) Deflator of the Private Consumption; LDCPU - (log) Deflator of the Public Consumption; LDDESP - (log) Deflator of the Public Expenditures.

Sources of LDPIB, LDCPRIV and LDCPU - between 1947 and 1955, respectively, Valério et al. (1989), Neves (1996) and Pinheiro (1997), between 1956 and 1995, Pinheiro (1997) for all the deflators, and between 1996 and 2002, the Ministry of the Economy (GEE department) also for all. LDDESP is the result of a construction a la Paasche, following Beck (1981).

Table 4.1 Unit Roots Tests

y_t	$\Delta^d y_t$	DF-GLS	ADF		Leybourne-McCabe (1994)	
			Interception	Interception and Trend	Interception	Interception and Trend
LCORR-LDDESP	d=0	-0.873(1)	-0.773(1)	-0.252(3)	3.748(1)***	0.688(1)***
	d=1	-4.108(3)***	-4.073(1)***	-4.123(1)***	0.198(3)	0.101(3)
	d=2	-9.180(1)***	-9.249(2)***	-10.194(1)***	0.078(1)	0.070(1)
LCPUB-LDCPU	d=0	-0.600(1)	-0.494(2)	0.076(1)	3.898(1)***	0.692(1)***
	d=1	-5.070(2)***	-5.055(2)***	-5.274(2)***	0.146(2)	0.030(2)
	d=2	-8.078(1)***	-8.124(1)***	-8.874(1)***	0.080(1)	0.028(1)
LREM-LDCPU	d=0	-0.642(2)	-0.537(2)	0.025(2)	3.875(2)***	0.688(2)***
	d=1	-3.988(2)***	-3.951(1)***	-3.980(1)**	0.204(2)	0.091(2)
	d=2	-7.642(2)***	-7.680(1)***	-8.354(1)***	0.053(2)	0.067(2)
LODC-LDCPU	d=0	-0.825(3)	-0.723(1)	-0.193(1)	3.775(3)***	0.672(3)***
	d=1	-7.194(6)***	-0.723(1)	-7.816(1)***	0.298(6)	0.107(6)
	d=2	-10.698(1)***	-7.222(1)***	-12.011(1)***	0.165(1)	0.020(1)
LJUR-LDCPRIV	d=0	-0.859(1)	-10.798(1)***	-0.234(1)	3.756(1)***	0.699(1)***
	d=1	-3.478(2)*	-0.758(1)	-3.370(1)*	0.236(2)	0.011(2)
	d=2	-8.120(1)***	-3.431(1)**	-8.925(1)***	0.207(1)	0.024(1)
LSUBS-LDDESP	d=0	-1.524(1)	-8.167(1)***	-1.031(1)	3393(1)***	0.610(1)***
	d=1	-5.839(4)***	-1.437(1)	-6.195(2)***	0.104(4)	0.0333(4)
	d=2	-9.944(6)***	-5.840(1)***	-11.109(2)***	0.005(6)	0.014(6)
LTRACOR-DCPRIV	d=0	-0.569(1)	-10.029(2)***	0.133(1)	3.915(1)***	0.695(1)***
	d=1	-4.943(3)***	-0.462(1)	-5.122(2)***	0.157(3)	0.103(3)
	d=2	-9.300(1)***	-4.925(1)***	-10.336(2)***	0.085(1)	0.080(1)
LCAP-LDDESP	d=0	0.214(1)	-9.370(1)***	0.538(1)	4.101(1)***	0.726(1)***
	d=1	-5.635(3)***	-0.100(1)	-5.951(1)***	0.144(3)	0.106(3)
	d=2	-9.333(6)***	-5.632(1)***	-10.377(1)***	0.087(6)	0.083(6)
LFBCF-LDDESP	d=0	-0.356(1)	-9.405(1)***	0.368(1)	4.031(1)***	0.714(1)***
	d=1	-5.215(2)***	-0.245(1)	-5.448(2)***	0.135(2)	0.282(2)***
	d=2	-8.894(4)***	-5.203(2)***	-9.853(1)***	0.063(4)	0.044(4)
LTRACP-LDCPRIV	d=0	-1.549(1)	-8.958(1)***	-1.060(2)	3.380(1)***	0.608(1)***
	d=1	-6.073(3)***	-1.462(2)	-6.476(1)***	0.091(3)	0.206(3)**
	d=2	-10.036(1)***	-6.079(1)***	-11.218(1)***	0.012(1)	0.014(1)
LDESP-LDDESP	d=0	-0.686(2)	-10.122(1)***	-0.028(1)	3.851(2)***	0.684(2)***
	d=1	-3.883(4)***	-0.582(1)	-3.854(2)**	0.210(4)	0.041(4)
	d=2	-8.444(2)***	-3.844(1)***	-9.313(1)***	0.040(2)	0.004(2)
LDESEMP	d=0	-1.673(3)	-8.498(2)***	-1.209(2)	3.312(3)***	0.597(3)***
	d=1	-5.209(1)***	-1.589(2)	-5.441(1)***	0.138(1)	0.128(1)*
	d=2	-7.440(3)***	-5.197(1)***	-8.111(3)***	0.016(3)	0.085(3)
LPIB-LDPIB	d=0	-1.619(1)	-7.473(3)	-1.144(3)	3.341(3)***	0.602(1)***
	d=1	-4.362(2)***	-1.534(3)***	-4.428(1)***	0.184(2)	0.040(2)
	d=2	-8.802(2)***	-4.333(1)***	-9.741(1)***	0.058(2)	0.0360(2)
LREC	d=0	-0.054(3)	-8.863(1)***	0.729(3)	4.196(3)***	0.740(3)***
	d=1	-1.956(2)	-0.063(3)	-1.548(2)	3.157(2)***	0.572(2)***
	d=2	-9.404(2)***	-1.878(2)	-10.463(2)***	0.090(2)	0.089(2)
LFUN	d=0	-0.740(3)***	-9.478(2)***	-0.092(3)***	3.821(3)***	0.680(3)***
	d=1	-4.460(3)***	-0.637(3)	-4.545(3)***	0.079(3)	0.003(3)
	d=2	-6.213(1)***	-4.433(3)***	-6.642(1)***	0.008(1)	0.002(1)
LTXAB	d=0	-0.999(3)	-6.221(1)***	-0.402(2)	3.679(3)***	0.657(3)***
	d=1	-7.080(1)***	-0.901(2)	-7.680(1)***	0.360(1)*	0.117(1)
	d=2	-10.321(2)***	-7.106(1)***	-11.559(1)***	0.149(2)	0.017(2)
LDIR	d=0	-2.466(3)	-10.413(1)***	-2.158(2)***	2.879(3)***	0.526(3)***
	d=1	-7.303(2)***	-2.398(3)	-7.948(2)***	0.238(2)	0.096(2)
	d=2	-9.292(2)***	-7.334(2)***	-10.328(2)***	0.084(2)	0.080(2)
LLOC	d=0	-0.877(3)	-9.363(2)***	1.844(3)	4.704(2)***	0.823(3)***
	d=1	-4.139(2)***	-1.014(3)	-4.160(3)***	0.197(2)	0.037(2)
	d=2	-7.932(2)***	-4.105(1)***	-8.699(1)***	0.105(2)	0.004(2)
LIDOS	d=0	-0.353(2)	-7.975(1)***	0.371(1)	4.032(2)***	0.714(2)***
	d=1	-2.440(4)	-0.242(1)	-2.126(1)	2.893(4)***	0.529(4)***
	d=2	-7.235(2)***	-7.264(2)***	-7.865(2)***	0.275(2)	0.103(2)
LTRACORP	d=0	-0.487(2)	-0.379(2)	0.210(2)	3.959(2)***	0.702(2)***
	d=1	-4.889(1)***	-4.871(1)***	-5.059(1)***	0.156(1)	0.031(1)
	d=2	-9.370(1)***	-9.433(1)***	-10.421(1)***	0.089(1)	0.008(1)

Notes: significance levels 10%(*), 5%(**) and 1%(***).

In the second column d = x identifies the x-th difference of the series.

Between parantheses, the preferred number of lags according to the Schwartz Criteria, in the ADF tests (Inter – with Interception, Inter/Trend – with Interception and Trend), or according to Ng and Penon (2001) in the DF-GLS and Leybourne-McCabe (1994) tests.

Source: Author's computation on the basis of the sources in Table D1.

Table 4.3 SOLS estimation

	Regressand variables										
Regressors	LCORR – LDDESP	LCPUB – LDCPU	LREM – LDCPU	LODC – LDCPU	LJUR – LDCPRIV	LSUBS – LDDESP	LTRACOR – LDCPRIV	LCAP – LDDESP	LFBCF – LDDESP	LTRACAP – LDCPRIV	LDESPT – LDDESP
LTXAB	NS	NS	NS	0.510*** (0.154)	1.431*** (0.426)	2.236*** (0.622)	NS	NS	NS	NS	0.202** (0.099)
LDESEMP	0.121*** (0.025)	NS	NS	NS	1.047*** (0.116)	0.448** (0.218)	NS	NS	0.231*** (0.051)	-0.477* (0.256)	0.113*** (0.030)
LPIB-LDPIB	0.923*** (0.051)	1.051*** (0.072)	0.830*** (0.055)	1.421*** (0.091)	NS	0.854** (0.458)	1.158*** (0.111)	NS	1.117*** (0.043)	NS	0.910*** (0.062)
LREC	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LFUN	0.501*** (0.120)	NS	0.511*** (0.102)	-0.998*** (0.180)	1.518*** (0.443)	3.032*** (0.966)	1.712*** (0.196)	NS	NS	5.511*** (0.402)	0.298** (0.130)
LDIR	0.194*** (0.053)	NS	NS	NS	NS	NS	NS	0.356*** (0.117)	0.424*** (0.153)	NS	0.190*** (0.068)
LLOC	-0.177*** (0.046)	0.096*** (0.038)	0.144*** (0.015)	NS	NS	-0.864* (0.432)	NS	NS	NS	NS	-0.142** (0.062)
LIDOS	NS	NS	NS	NS	1.332** (0.547)	NS	NS	NS	NS	NS	NS
AUTARQ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
AREP	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
COR	NS	NS	0.068*** (0.020)	NS	-0.314*** (0.097)	NS	0.175*** (0.043)	NS	NS	NS	NS
LTRACORP	0.197*** (0.028)	0.105*** (0.038)	0.374*** (0.040)	NS	NS	NS	NS	0.707*** (0.014)	NS	NS	0.198** (0.074)
R2	0.999	0.998	0.997	0.983	0.984	0.948	0.994	0.990	0.981	0.913	0.999
DW	1.493	1.137	1.039	1.061	1.075	1.334	0.801	0.847	0.862	1.106	1.288
ADF	-5.603**	-4.005*	-4.454*	-5.516***	-4.577***	-4.730*	-4.176**	-3.732*	-4.429**	-5.181***	-5.107

Notes: Significance levels: 10% (*), 5% (**) and 1% (***) – In the cells concerning the estimation of the coefficients, the null hypothesis is identified with the non-significance of the results while the null hypothesis related to the values in the last line (ADF statistic on the residual series) is identified with the non-cointegration among the regressands and the regressors according to critical values specified in Haldrup (1994) and MacKinnon (1996). Between parentheses, below the estimated coefficients, the standard errors are exhibited. "NS" signifies that the estimated coefficient was not significant in previous estimations and "NA" signifies that the hypothesis of the homogeneity of the regressor was considered in the estimation.

Source: Author's computation on the basis of the sources in Table D1.

Table 4.5 SOLS estimation (including the hypothesis of product homogeneity, if confirmed in Table 4.3)

	Regressand variables										
Regressors	(LCORR – LDDESP) – (LPIB-LDPIB)	(LCPUB – LDCPU) – (LPIB-LDPIB)	LREM – LDCPU	LODC – LDCPU	LJUR – LDCPRIV	(LSUBS – LDDESP) – (LPIB-LDPIB)	LTRACOR – LDCPRIV – (LPIB-LDPIB)	LCAP – LDDESP	(LFBCF – LDDESP) – (LPIB-LDPIB)	LTRACAP – LDCPRIV	(LDESPT – LDDESP) – (LPIB-LDPIB)
LTXAB	NS	NS	NS	0.510*** (0.154)	1.431*** (0.426)	1.938*** (0.531)	NS	NS	NS	NS	0.159** (0.067)
LDESEMP	0.147*** (0.021)	NS	NS	NS	1.047*** (0.116)	0.708*** (0.139)	NS	NS	0312*** (0.043)	-0.477* (0.256)	0.140*** (0.020)
LPIB-LDPIB	NA	NA	0.830*** (0.055)	1.421*** (0.091)	NS	NA	NA	NS	NA	NS	NA
LFUN	0.328*** (0.088)	NS	0.511*** (0.102)	-0.998*** (0.180)	1.518*** (0.443)	3.521*** (0.501)	1.983*** (0.048)	NS	NS	5.511*** (0.402)	0.197** (0.088)
LDIR	0.194*** (0.053)	NS	NS	NS	NS	NS	NS	0.356*** (0.117)	0.537*** (0.155)	NS	0.195*** (0.052)
LLOC	-0.166*** (0.030)	0.109*** (0.013)	0.144*** (0.015)	NS	NS	-0.955*** (0.086)	NS	NS	NS	NS	-0.180*** (0.029)
LIDOS	NS	NS	NS	NS	1.332** (0.547)	NS	NS	NS	NS	NS	NS
COR	NS	NS	0.068*** (0.020)	NS	-0.314*** (0.097)	NS	0.182*** (0.043)	NS	NS	NS	NS
LTRACORP	0.197*** (0.028)	0.040** (0.017)	0.374*** (0.040)	NS	NS	NS	NS	0.707*** (0.014)	NS	NS	0.208*** (0.027)
R2	0.993	0.976	0.997	0.983	0.984	0.818	0.979	0.990	0.774	0.913	0.994
DW	1.393	1.008	1.039	1.061	1.075	0.999	0.840	0.847	0.861	1.106	1.373
ADF	-5.475**	-4.785***	-4.454*	-5.516***	-4.577***	-4.763**	-4.272**	-3.732*	-4.221**	-5.181***	-5.815**

Notes: see Table D4.

Source: Author's computation on the basis of the sources in Table D1.

Table 4.5 DOLS and NLS estimations (including the hypothesis of product homogeneity, if confirmed in Table 4.3)

		Regressand variables										
Regressors	Metoda procjene	(LCORR – LDDESP) – (LPIB – LDPIB)	(LCPUB – LDCPU) – (LPIB – LDPIB)	LREM – LDCPU	LODC – LDCPU	LJUR – LDCPRIV	(LSUBS – LDDESP) – (LPIB – LDPIB)	LTRACOR – LDCPRIV – (LPIB – LDPIB)	LCAP – LDDESP	(LFBCF – LDDESP) – (LPIB – LDPIB)	LTRACAP – LDCPRIV	(LDESPT – LDDESP) – (LPIB – LDPIB)
LTXAB	DOLS	NS	NS	NS	0.244 (0.397)	3.455 (0.866)	1.678 (1.038)	NS	NS	NS	NS	0.046 (0.155)
	NLS	NS	NS	NS	0.612 (0.198)	0.898 (0.463)	2.871 (0.707)	NS	NS	NS	NS	0.118 (0.122)
LPIB-LDPIB	DOLS	NA	NA	0.669 (0.233)	1.570 (0.222)	NS	NA	NA	NS	NA	NS	NA
	NLS	NA	NA	0.948 (0.078)	1.464 (0.150)	NS	NA	NA	NS	NA	NS	NA
LFUN	DOLS	0.416 (0.334)	NS	0.343 (0.326)	-0.997 (0.514)	-1.807 (1.847)	6.590 (1.418)	1.992 (0.051)	NS	NS	5.699 (0.519)	0.119 (0.319)
	NLS	0.405 (0.143)	NS	-0.121 (0.151)	-1.105 (0.312)	2.808 (0.648)	3.030 (0.664)	2.016 (0.044)	NS	NS	5.779 (0.427)	0.208 (0.188)
LDESEMP	DOLS	0.261 (0.055)	NS	NS	NS	1.644 (0.359)	0.538 (0.375)	NS	NS	0.195 (0.084)	-0.624 (0.346)	0.295 (0.058)
	NLS	0.198 (0.034)	NS	NS	NS	0.983 (0.177)	0.637 (0.173)	NS	NS	0.363 (0.053)	-0.657 (0.281)	0.167 (0.037)
LDIR	DOLS	0.010 (0.141)	NS	NS	NS	NS	NS	NS	0.263 (0.245)	1.011 (0.343)	NS	-0.025 (0.125)
	NLS	0.025 (0.080)	NS	NS	NS	NS	NS	NS	0.084 (0.142)	0.281 (0.202)	NS	-0.009 (0.104)
LLOC	DOLS	0.031 (0.036)	0.086 (0.021)	0.079 (0.032)	NS	NS	-1.575 (0.200)	NS	NS	NS	NS	0.103 (0.047)
	NLS	-0.141 (0.034)	0.090 (0.014)	0.099 (0.017)	NS	NS	-0.957 (0.106)	NS	NS	NS	NS	-0.143 (0.039)
LIDOS	DOLS	NS	NS	NS	NS	3.001 (1.483)	NS	NS	NS	NS	NS	NS
	NLS	NS	NS	NS	NS	0.290 (0.66)	NS	NS	NS	NS	NS	NS
COR	DOLS	NS	NS	-0.010 (0.004)	NS	-0.004 (0.095)	NS	0.166 (0.043)	NS	NS	NS	NS
	NLS	NS	NS	0.021 (0.022)	NS	-0.217 (0.114)	NS	0.146 (0.040)	NS	NS	NS	NS
LTRACORP	DOLS	0.099 (0.063)	0.076 (0.031)	0.272 (0.155)	NS	NS	NS	NS	0.721 (0.025)	NS	NS	0.061 (0.058)
	NLS	0.170 (0.038)	0.070 (0.020)	0.430 (0.075)	NS	NS	NS	NS	0.736 (0.016)	NS	NS	0.190 (0.042)

Note: "NS" signifies that the estimated coefficient was not significant in previous estimations. "NA" signifies that the hypothesis of the homogeneity of the regressor was considered in the estimation. "NP" signifies that the combining values did not reveal a range characterized only by negative or positive estimations.

Source: Author's computation on the basis of the sources in Table D1.

Table 4.6 Error Correction Models estimations

	Regressand variables										
Regressors	Δ [(LCORR-LDDESP) – (LPIB-LDPIB)]	Δ [(LCPUB-LDCPU) – (LPIB-LDPIB)]	Δ (LREM-LDCPU)	Δ (LODC-LDCPU)	Δ (LJUR-LDCPRIV)	Δ [(LSUBS-LDDESP) – (LPIB-LDPIB)]	Δ [(LTRACOR-LDCPRIV) – (LPIB-LDPIB)]	Δ (LCAP-LDDESP)	Δ [(LFBCF-LDDESP) – (LPIB-LDPIB)]	Δ (LTRACAP-LDCPRIV)	Δ[(LDESPT-LDDESP) – (LPIB-LDPIB)]
Δ(LTXAB)	NS	NS	NS	0.373(0)** (0.156)	0.211(0) (0.230)	1.624(0)*** (0.462)	NS	NS	NS	NS	0.192(0)*** (0.067)
Δ(LDESEMP)	0.149(0)*** (0.027)	NS	NS	NS	0.322(0)*** (0.096)	0.528(0)*** (0.187)	NS	NS	0.116(2) (0.082)	0.449(2) (0.314)	0.158(0)*** (0.025)
Δ(LPIB-LDPIB)	NA	NA	0.609(0)*** (0.139)	0.834(0)*** (0.241)	NS	NA	NA	NS	NA	NS	NA
Δ(LFUN)	0.278(0)* (0.144)	NS	0.240(0) (0.157)	-0.369(0) (0.341)	1.390(0)*** (0.493)	3.006(0)*** (1.013)	0.779(0)** (0.295)	NS	NS	1.685(0) (1.481)	0.059(0) (0.174)
Δ(LDIR)	0.084(0)* (0.048)	NS	NS	NS	NS	NS	NS	0.398(0)*** (0.124)	0.116(0) (0.146)	NS	0.098(0)* (0.050)
Δ(LLOC)	-0.100(0)** (0.046)	0.035(0) (0.050)	0.058(0) (0.062)	NS	NS	-0.437(0) (0.288)	NS	NS	NS	NS	-0.059(0) (0.056)
ΔΔ (LIDOS)	NS	NS	NS	NS	4.674(0)* (2.440)	NS	NS	NS	NS	NS	NS
COR	NS	NS	0.021* (0.010)	NS	0.022 (0.039)	NS	0.026*** (0.003)	NS	NS	NS	NS
Δ (LTRACORP)	0.216(0)*** (0.048)	0.035(0) (0.065)	0.304(0)*** (0.065)	NS	NS	NS	NS	0.674(0)** (0.110)	NS	NS	0.362(0) (0.071)
ut-1	-0.695*** (0.136)	-0.524*** (0.115)	-0.341*** (0.110)	-0.520*** (0.118)	-0.436*** (0.080)	-0.414*** (0.121)	-0.245*** (0.096)	-0.433*** (0.116)	-0.254** (0.107)	-0.549*** (0.104)	-0.527*** (0.136)
R2	0.717	0.281	0.459	0.415	0.572	0.458	0.198	0.386	0.216	0.380	0.709
X2Norm	1.136	6.798**	3.014	0.044	3.125	1.437	12.828***	2.689	0.769	1.882	0.369
FAR	0.559	1.562	1.852	1.733	1.081	1.775	2.013	0.713	0.722	0.608	1.272
FARCH	0.448	0.618	0.597	2.531*	1.015	1.443	0.715	1.069	0.526	4.157***	0.440
FHET	0.605	1.486	0.781	0.346	1.691	1.435	2.593**	0.710	1.183	2.291**	1.153

Notes: Significance levels: 10% (*), 5% (**) and 1% (***) – In the cells concerning the estimation of the coefficients, the null hypothesis is identified with the non-significance of the results while the null hypotheses related to the values in the last four lines (normality of the residual series, Breusch-Godfrey test with 4 lags, ARCH with 4 lags and Test for the Heteroskedasticity) are identified with the normality of the residual series, the absence of autocorrelation, the non-identification of the residual series with an auto-regressive conditional heteroskedasticity model and the absence of residual heteroskedasticity. Between parentheses, below the estimated coefficients, the standard errors are exhibited. . Between parentheses, immediately following the estimated coefficients, the preferred lag of the first difference of the regressor is exhibited, according to Hendry (1995). "NS" signifies that the estimated coefficient was not significant in the previous estimations and "NA" signifies that the hypothesis of the homogeneity of the regressor was considered in the estimation.

Source: Author's computation on the basis of the sources in Table D1.