

The Regional Economics Applications Laboratory (REAL) of the University of Illinois focuses on the development and use of analytical models for urban and regional economic development. The purpose of the **Discussion Papers** is to circulate intermediate and final results of this research among readers within and outside REAL. The opinions and conclusions expressed in the papers are those of the authors and do not necessarily represent those of the University of Illinois. All requests and comments should be directed to Geoffrey J. D. Hewings, Director, Regional Economics Applications Laboratory, 607 South Matthews, Urbana, IL, 61801-3671, phone (217) 333-4740, FAX (217) 244-9339.

Web page: www.uiuc.edu/unit/real

DOES THE TRADE BALANCE REALLY MATTER
FOR REGIONS?
Pedro Nogueira Ramos

REAL 05-T-7 May, 2005

Does the Trade Balance Really Matter for Regions?*

Pedro Nogueira Ramos

Faculty of Economics, University of Coimbra, Portugal

Abstract: This paper explores the reasons why regional economics does not focus on the regional balance of payments. The main focus will be to gauge the importance of external imbalances in regional economies, with that concept being confined to the trade (goods and services) account. Discussion centers on why regions can run wider trade deficits than nations and it is argued that they may even benefit regional economies. Notwithstanding the limited data available, empirical evidence for EU regions is put forward to supporting the idea that regions meet more frequently trade imbalances of relevant size than those faced by countries.

1. Introduction

There are not many studies in the literature that deal with the external trade balances of regions within a country, whether it concerns international exchanges or interregional flows. This gap is partly due to the frail statistical coverage of this issue: in fact, although in several countries international trade is known by regions, because national surveys often provide information on the regional distribution, the situation is quite different regarding the interregional trade. The data are rarely available and, as a result, little attention has been directed to regional trade imbalances as a substantive problem for research.

The purpose of this paper is to gauge the importance of external imbalances in regional economies, comparing with countries, despite of this shortage of information on the regional external trade phenomenon. We proceed with this main design in section 3, where we decompose the cross-sectional variance of GDP growth for OECD countries, for the 15 European Union (EU) countries that were already members before the 2004 enlargement, and also partially for 162 EU regions. At the regional level, we focus on the contribution of investment rates fluctuations to that variance that we found to be consistent with our claim of relevant regional trade disequilibria. In section 2, we address the question of why regions register wider trade

* This paper was concluded during a short term stay in REAL – Regional Economics Applications Laboratory, at the University of Illinois at Urbana-Champaign, in May 2005. Financial support from Fundação Calouste Gulbenkian, Lisbon, Portugal and the hospitality of REAL are gratefully acknowledged. The author would like to thank Geoffrey Hewings as well for his stimulus and helpful comments.

imbalances, and why these imbalances do not seem to cause serious trouble, rather they seem to benefit regional economies. In this section we argue that countries face sustainability constraints that as a rule, although having different impact in different kind of countries, limit them from running important external deficits. However for regions we enumerate (relying on their peculiarity) several reasons why they can avoid those constraints and are then allowed to enjoy benign imbalances.

Meanwhile, in the remaining part of this section we briefly review some more relevant literature that discusses our question. In fact, there is a relatively widespread agreement that regions may run large trade imbalances that as a rule would not be sustainable for countries. For instance, in some previous work, Sargento and Ramos (2003) estimated for the Portuguese regions that trade imbalances could exceed 20% of regional GDP.¹ The great majority of literature that focuses on this subject, however, proceeds from an alternative approach that looks at external imbalances by the gap between regional (national) savings and the regional (national) investment. Papers such as Bayoumi and Rose (1993), Dekle (1996), Helliwell and McKittrick (1999) and Decressin and Disyatat (2000) fit into a well known issue of economic theory, the Feldstein-Horioka (FH) puzzle. This stream of literature followed the already classic paper by Martin Feldstein and Charles Horioka (Feldstein and Horioka, 1980) where these authors argued – presenting empirical evidence for industrialized countries at the national level – that the path of domestic investment is constrained by the availability of domestic savings, that being a signal in their view of weak international capital mobility. Of course, a strict correlation between domestic investment and savings (both expressed as a proportion of GDP) is another way of saying that external disequilibrium is reduced, as resorting to external savings is avoided. While the FH findings proved to be robust in empirical tests (at international level), after extended contest, the same can no longer be said of their puzzle disentangling. In fact, the idea that weak international capital mobility is behind the FH outcome, and so is the cause of reduced external disequilibrium of national economies, has been repeatedly rejected by a large sector of the literature. Indeed,

¹ The problem with these estimates is that, albeit derived in the scope of resources and uses equilibrium in a multi-regional input-output model, they rely on rough figures for the regional households consumptions. Indeed, the total consumption of the households residing in each region, was derived by multiplying the regional disposable income of households, accurately provided by official Regional Accounts, by a propensity to consume that was in fact (and that was the problem) an average of three divergent estimates obtained by different methods. Please see Sargento and Ramos (2003), Annex, for details.

countries may not turn to external savings falling into external imbalances, not because they are not allowed to, but because they need not. Domestic investment may range with domestic savings (at countries level) because both are affected by common factors and not by reason of weak capital mobility.²

The shift of an important sector of the FH puzzle debate from the international relationships to the interregional arena happens because for regions, unlike countries, investment and savings seem not to match. It was therefore argued that the burden of explaining why the same approach was sound at the interregional level, but was supposed to fail for international analysis, should be carried by the critics of the FH approach. However, from our point of view, that achievement was important as well by a second motivation, namely showing that regional investment and savings could diverge sharply, when at the national level those variables were highly correlated, means that external imbalances may happen more often and in a large scale at the regional level than among countries.

The difficulty however, in the analysis of regional external imbalances through the investment-savings gap, was that the performance of the FH test at the interregional level was impaired by the lack of suitable data, namely by the non-existence of accurate (and official) statistical information on regional domestic savings. In effect, for defining regional savings in the standard way adopted by National Accounts for countries, it would be necessary to have full information on the external current accounts for regions, incorporating the factor income balance and the unrequited transfers, beyond the trade balance on goods and services. In fact, National Accounts calculate domestic savings by:

$$S = NDI - C$$

where C is the private (households and non-profit institutions) and public (general government) consumption, and NDI is the National Disposable Income, obtained from the Gross National Income³ (GNI) and from GDP by the following National Accounts definitions:

$$NDI = GNI + NT$$

$$GNI = GDP + FI$$

² For a general overview on the FH controversy, please address Obstfeld and Rogoff (1996), pp. 161-164 and Coakley *et al.* (1998).

³ Previously designated Gross National Product (GNP) in old National Accounts plans

NT is the balance of net current transfers and FI the net factor income balance with the rest of the world.

Starting then with the basic macroeconomic identity:

$$GDP = C + I + X - M \quad (1)$$

where I is the investment, and X and M the goods and services exports and imports, we easily get:

$$S - I = [(GDP + FI + NT) - C] - I = CA \quad (2)$$

where CA is the current account balance that is achieved by adding to the trade balance (TB), the factor income and net transfers balances:

$$TB = X - M;$$

$$CA = TB + FI + NT$$

Equation (2) makes clear as well, in a formal way, why external imbalance may be assessed by the investment-savings gap.

However, at regional level, as information on FI and NT is not as a rule available,⁴ the usual procedure adopted in literature is to reduce the concept of regional domestic savings to:

$$S^R = GDP - C$$

from where:

$$S^R - I = (GDP - C) - I = X - M = TB \quad (3)$$

Thus, the alternative approach, followed at regional level, is based on (3) instead of (2), where S^R replaces S , focusing then the analysis on trade balance (TB) and foregoing the current account (CA).

From our point of view, this is a reasonable procedure as we can agree with Decressin and Disyatat (2000), for whom savings is a normative concept and the classification, for instance, of the Marshall Plan aid, as American or European savings is merely a conventional option. We shall stress, however, that when we change the concept of savings at regional level, replacing S by S^R , we shall proceed in the same way for countries for a comparison of the investment/savings

⁴ FI seems to be, at regional level, the trickiest part to estimate, mainly because of the interregional distribution of property income (dividends, bond interests, etc...) when other sectors but households are the beneficiaries. That is the reason why Regional Accounts as a rule do not provide further estimates for GNI beyond regional $GDPs$. Contradicting this remark, Dekle (1996) claim to have data for regional GNI for Japan, but he still misses information on NT to estimate NDI

gap at both levels.⁵ For the sake of consistency, our goal in this paper is then to gauge for the importance of external imbalances in regional economies, comparing with countries standard, confining in both cases the external imbalance concept to trade (goods and services) imbalance, and thus not examining current accounts.

2. How can regions stand for larger trade imbalances?

There is an important sector in the economic literature (see for instance Obstfeld and Rogoff, 1996) for whom external imbalances really improve economic efficiency, as they allow countries (and thus regions as well) to profit from the opportunity of intertemporal trade. The implications are that some countries or regions can avoid sharp contractions on their consumption and/or investment, when a temporary shortfall occurs in their production, while other countries or regions with ample savings can use this channel for directing their excessive thrift outside the local (national or regional) economy.

Figure 1, reproduced from Obstfeld and Rogoff (1996), sheds light on how the efficiency gain is made up. The scheme is only based on consumption since investment is not considered. If the country (or region) cannot run into a trade imbalance, then it must consume in each period its whole product (Y), so:

$$Y_i - C_i = X_i - M_i = 0 \quad i = 1, 2$$

is in the autarky point A in the diagram. On the contrary, if the country can anticipate consumption, the optimal choice point is C , that it attains by moving on its budget line until the outward indifference curve. This movement is made possible only through a current account

⁵ Unfortunately, this obvious caution has not been taken into account all over the literature. Decressin and Disyatat (2000) propose to adopt a concept of national savings $S^N = GNI - C$, that they state to be closer to that used for the regions (S^R), but that in fact do not coincide with it. The same mistake is implicitly made by Bayoumi and Rose (1993) and Dekle (1996), that do not produce their own estimates for countries, but compare their regional estimates with those available, based on National Accounts S , in FH literature. On the contrary, Armstrong *et al.* (1996) agree with our concern, searching for an equivalent concept of savings for EU members which compares with the one used by Bayoumi and Rose for British regions. The problem, however, is that the concept kept in both papers for savings $GDP - C$, assumes C as being merely the private consumption. Then, as the authors recognize, the so-defined S^R comes to be the result of adding up public consumption to true saving. In our opinion, this a misleading procedure because the gap that the authors then find, between their so-defined S^R and I , may be explained by an uneven weight of government over the regions or the countries, rather than by a strong capital mobility (or taking our view, rather than by a wider external imbalance).

deficit in period 1, $-CA_1$, (that exactly matches the trade deficit when, in a simplified scheme, factor income and unrequited transfers are excluded).⁶

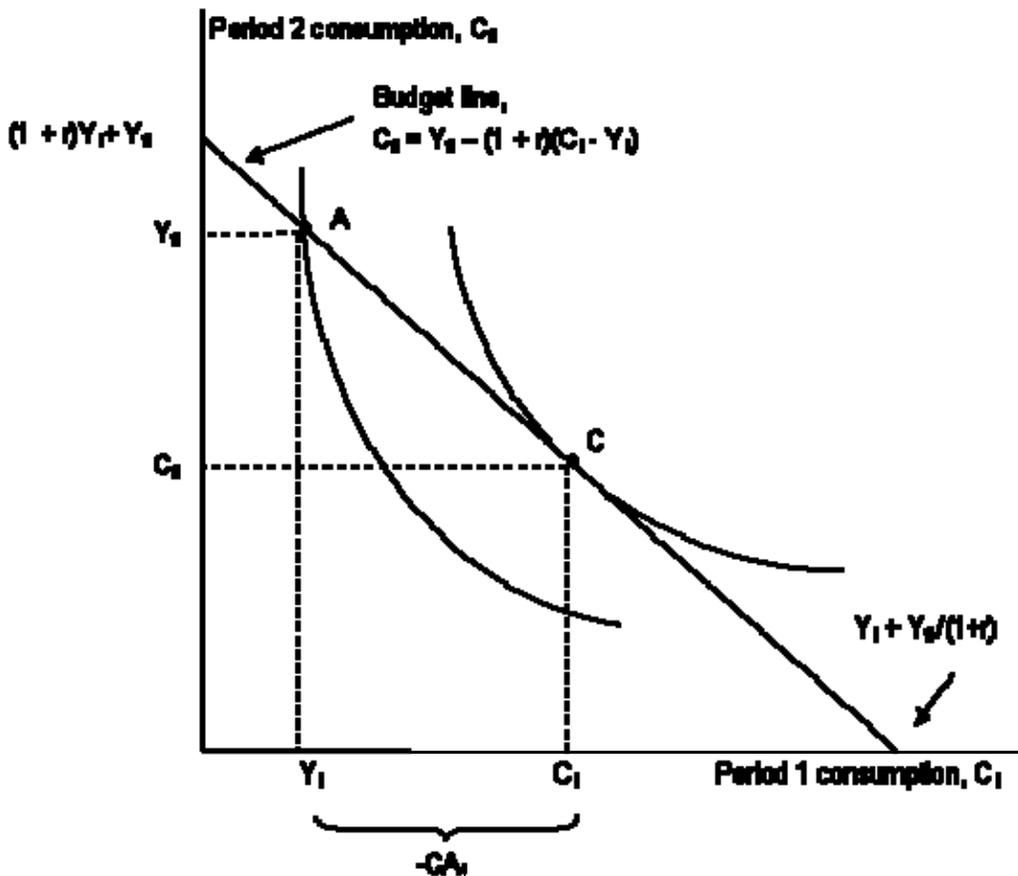


Fig. 1 Consumption over time and the current account

The FH literature that we mentioned above is in fact part of this efficiency approach. The frustrated international capital mobility is there seen as a problem for the world economy, as it fasten investments to the places where saving is made. Note that, in this view, a deficit cannot be said to be a bad thing and a trade surplus a good one, or the opposite, because deficits only can happen if other countries (or regions) run surpluses. The argument is rather that a deficit is

⁶ This over-simplified model may of course be embedded in a more sophisticated frame, as is done in Obstfeld and Rogoff (1996), in Chapter 2, where the model is extended for a multi-period environment, or in the Chapter 3 that adopts an overlapping generations model, without losing its main feature: that external imbalance may turn into an efficiency gain. An alternative overview of the external accounts models and of the imbalance issue – that emphasizes as well the Obstfeld and Rogoff contribution – may be found in Knight and Scacciavillani (1998)

good to the places where capital is scarce (very likely to the developing countries – or regions) and a superavit a good event for where capital is abundant (the richest countries, we presume), allowing for higher returns than domestic applications.

The problem with this efficiency approach is however that it ignores the sustainability issue.⁷ In fact, the foreigner agents underwriting the external imbalance bear a risk of loosing their capital. This is true either when the capital movements consist of credit relationships, or even in the more general case when they refer to any other kind of right that may be disclaimed. In a world of imperfect information and imperfect control, microeconomic theory admits that market failures may lead to insufficient capital mobility, or sometimes, on the contrary, to over-investment.

Our interest, however, is not attached to a microeconomic approach. The sustainability issue raised by external imbalances is a macroeconomic problem that Catte (1998) defines as follows: “*Why are solvency and financing constraints usually examined also for a country as whole, and not simply for the individual economic agents in that country (including government)?*” (p. 148, italics from the author). However, just as we have appreciated the way Catte (1998) raises his question on macroeconomic sustainability, we cannot on the contrary be satisfied with his answer, which is partially tautological: he notes that the deficit issue arises at the country level because public policy is formulated for countries. On the other hand, Catte is persuaded as well that the macro-sustainability is a matter of “reputational externalities:” as obtaining and processing information is costly, markets may question the sustainability of each economic agent on the basis of the country where he/she operates. Hence, if a group of borrowers residing in one country becomes insolvent, this may affect “country risk,” and therefore other agents that otherwise would be considered sound, may face difficulties in market access.

At this stage, and giving credit to the reputational externalities explanation suggested by Catte (1998) on the national deficit issue, it is time to wonder if the same argument can be extended to the regional economies. Although we admit that a definitive answer to this question can only be found through empirical analysis, anyhow we offer an intuitive answer: no, as a rule. In our

⁷ An interesting recent contribution, that claims to be consistent with the intertemporal approach, is provided by Ventura (2003). In this paper, risk and portfolio diversification are the key concepts instead of sustainability. The main argument is that even when a temporary increase in savings happens, economic agents avoid applying it fully abroad, preferring the domestic investment, because that rebalancing of portfolio toward foreign investment would increase risk sharply.

view, save exceptional cases, individual agents do not identify themselves with their region's well being in the same way that they do with their country. Furthermore, even at countries' level, reputational externalities do not seem to have a similar impact everywhere. Knight and Scacciavillani (1998) analyzed three case studies – Italy, Israel and Pakistan – and concluded that the relevance of an external deficit is quite distinct for each one. While for Italy an external imbalance is merely an indicator of macroeconomic stance, Israel should face an effective intertemporal sustainability constraint, whereas Pakistan is taken as an example of a financed-constrained economy where it is essential to ensure that the current account position is continuously consistent with the available sources of financing. Other examples, such as Australia and Canada that remained in external deficit position for more than one century (Australia still does), deserve as well special attention in literature (for instance, in Obstfeld and Rogoff, 1996, pp. 67-70). In spite of their persistent, and sometimes immense, deficits, these countries always avoid any debt crisis, showing that the credibility of institutions may be more important than the deficit itself, however prevalent it is.

However, it is not only by the reason of the very likely irrelevance of reputational externalities at the regional level that we believe that the sustainability issue may correctly be disregarded when regional external imbalances are under consideration. Other pertinent reasons are:

- the remarkable importance in some regional economies of multiregional firms, with plants operating inside the regions that are not independent legal entities, and so are not liable alone for their debt (on the theoretical ground a regional budget constraint should result from adding up the individual budget constraints of resident agents; but when some relevant agents are not legal entities, they do not face budget constraints from their own, and so that aggregated regional budget constraint does not exist;
- the large interregional income redistribution that those multiregional agents may grant, when they distribute dividends to their shareholders, or interests to their lenders, sometimes residing in significant numbers outside of the region, or even paying wages to employees living in neighbouring regions (this interregional distribution of income unbalances factor income flows, which may therefore finance and justify a compensating trade imbalance);

- the multiregional shape of the financial system and of the great majority of the units belonging to it; in fact, in the international environment, households and corporations' foreign debt is seldom handled directly, but it is very often intermediated by the national financial system, that incurs the liability itself in the international markets. Country risk is then to a great extent its financial system breakdown risk; for regions, however, the role of the financial system is quite different, as financial institutions usually operate all over the country, and they do not concentrate in their regional branches the risk deriving from their local customers;
- the importance of interregional governmental transfers that may substitute for exports and then finance ample trade imbalances;⁸
- the lower legal capacity of regional and local governments that prevents the generation of sovereign-type risk at the regional level; regional and local governments are not immune from national laws and they have no capacity to protect private agents when they default;
- at finally, obviously regions do not have their own currency, and so there is not an exchange market and risk; we are not going however to overstress this point because several European countries renounced their own currencies and are now, like regions, sharing the Euro; interestingly, that that does not seem to have relieved the Euro national governments of worrying about their external deficits.

For all those reasons, we do believe that the sustainability issue does not apply for regional trade deficits,⁹ in contrast to the efficiency approach that in our opinion remains valid. By the same token, capital mobility promotes economic efficiency, even if it induces important trade deficits, allowing investors to search for more profitable locations besides savings locations. In the

⁸ Eurostat has promoted in several European countries pilot studies on general government regional accounts, with the aim of gauging this kind of transfers, whether they are explicit or merely implicit. For a description of this experience see Ramos (2000)

⁹ As a matter of fact we may acquiesce that this statement may depend on what we mean by regions. A very large region or a group of regions looks probably more "like a country" than "like a region" in many aspects. In any way, we have only found one paper that clearly asserts that the external imbalance sustainability does matter for regions: Thirlwall (1980). The main proposition in this article is that "no country or region (for very long) can grow faster than its balance-of-payments growth rate *unless it can continually "finance" a rate of growth of imports in excess of the rate of growth of exports*" (p. 421; italics ours). This above safeguard in italics – that really means that the non-existence of capital inflows is assumed rather than proofed – is frequently repeated all over the paper. Thirlwall and Hussain (1982), a later paper that in fact only deals with countries, released explicitly that assumption, allowing for a current account deficit. The debate on the above proposition that would be known in literature by Thirlwall's Law (or the 45-degrees rule in Krugman, 1989, designation), would proceed exclusively, as far as we know, at countries level, without any appeal to the regional peculiarity.

remaining part of this paper, we then look for some empirical proof on higher frequency of sizeable imbalances for regions, given our argument of the irrelevance of sustainability at the regional level.

3. Some empirical evidence on trade imbalances at regional level

The purpose of this section is to provide empirical evidence that trade imbalances happen more often with a considerable dimension, for European Union (EU) regions, than they arise either for OECD countries or the 15 EU countries that were members before the May 2004 enlargement (EU15). As a matter of fact, our prior expectation is that the EU15 may lie in some kind of an intermediate position between regional sharp trade imbalances and the more balanced regime typical of countries (here represented by the OECD members).

The basic idea of our test, that proceeds from Asdrubali *et al.* (1996) and Sorensen and Yosha (1998), is that economic agents – either at national or regional level – search for a smooth intertemporal path for their (private and public) consumption C . Variable C should then (to some extent) be immune from idiosyncratic shocks in the level of production of the very country or region we are examining. This behavior, that those authors designated as “risk sharing”, consists of the attempt to stabilize the fraction k_t^i defined as:

$$k_t^i = C_t^i / C_t^w$$

where i is the lower-level space, the country for a cross-country analysis or the region for the regional approach, and w the high-level space, the world in the former case or the country in the regional one. In case of full risk sharing, k_t^i becomes a constant, not depending on t (neither on the lower-level space GDP hypothetically hit by idiosyncratic disturbance).

Our proposal, similar to the one of Asdrubali *et al.* (1996) and Sorensen and Yosha (1998), is then to proceed to the decomposition of the cross-sectional variance of shocks to GDP, here based on the identity ahead (please note that by (1): $GDP - I = TB + C$):

$$GDP \equiv \frac{GDP}{GDP - I} \cdot \frac{TB + C}{C} \cdot C \quad (4)$$

Following those authors we easily reach:

$$\begin{aligned} \text{var}(GDPgr) &= \text{var}(\Delta \ln GDP) = \text{cov}[\Delta \ln GDP - \Delta \ln(GDP - I), \Delta \ln GDP] + \\ &+ \text{cov}[\Delta \ln(TB + C) - \Delta \ln C, \Delta \ln GDP] + \text{cov}(\Delta \ln C, \Delta \ln GDP) \end{aligned}$$

Dividing both sides of the equality by the cross-sectional variance of the GDP growth rate $\text{var}(GDPgr)$, we get:

$$1 = \beta_1 + \beta_2 + \beta_3 \quad (5)$$

Where β_1 , β_2 and β_3 , that are the shares in the decomposition of the variance of $GDPgr$, coincide with the slopes obtained by the OLS of the regressions of $\Delta \log GDP - \Delta \log(GDP - I)$, $\Delta \log(TB + C) - \Delta \log C$, and $\Delta \log C$ on $GDPgr$.

Clearly, if there is full risk sharing, and therefore specific product disturbance does not spread at all into consumption, then $\text{cov}(\Delta \log C, \Delta \log GDP) = 0$ and $\beta_3 = 0$. When, on the other hand, $\beta_3 \neq 0$, consumption fluctuations are not fully exempted from idiosyncratic impacts on GDP, and $1 - \beta_3$ is to be regarded as the risk sharing degree among a conglomerate of (national or regional) economies.

If full or partial risk sharing does exist within a set of economies ($0 \leq \beta_3 < 1$), then by (5) either β_1 or β_2 or both are positive and significantly different from zero. When β_1 is positive, we conclude that consumption stabilizing has been the focus at the expense of investment. This happens because the investment rate (I/GDP) declines during recession or weak growth periods, but booms when production increase, making the most of positive temporary product shocks not affecting consumption.

When we have β_2 significantly positive, we may then assert that the risk sharing stabilizer mechanism is feed by external savings (measured in a broad sense by $-TB^{10}$). The implication is that when the economy slows, economic agents lay their hands on the external savings to protect their consumption path, and also eventually for keeping their investment up (if $\beta_1 \equiv 0$ at the same time). On the other hand, when the economy grows faster than their partners, $\beta_2 > 0$ means that dependence on external savings lessens, or even that the economy exports excessive savings

¹⁰ Following our discussion of section 1 we define the external savings, *in a broad sense*, as including the unrequited transfers, whether they are current or capital transfers in National Accounts. Resuming the Decressin and Disyatat (2000) example on Marshall Plan aid, this is seen, on that broad sense concept, as American savings yielded to Europe. Our broad sense external savings still incorporate as capital movements their own income (and other factors compensations as well) whether they are reinvested or consumed.

through a superavit $TB > 0$. β_1 and β_2 are of course the shares assigned to each one of these mechanisms in the risk sharing process.

In fact, at the country level (OECD and EU15), unlike regions, we went further decomposing β_2 – the contribution of external savings (in broad sense gauged by $-TB$) to the smoothing mechanism – as follows:

$$\frac{TB+C}{C} \equiv \frac{TB+C}{-NT-FI+C} \frac{-NT-FI+C}{-FI+C} \frac{-FI+C}{C} \quad (6)$$

implying:

$$\beta_2 = \beta_{21} + \beta_{22} + \beta_{23} \quad (7)$$

where β_{21} , β_{22} and β_{23} are the slopes of the OLS regressions of the growth rates of the parts in (6) above on $GDPgr$. β_{21} represents the contribution of the strict National Accounts measure of external savings, generated through the current account deficit $-CA$, to the risk sharing process (please take into account that CA is the difference between the numerator and the denominator in the first ratio above as $TB = CA - NT - FI$). β_{22} is the share of international transfers to that process, and β_{23} the contribution for consumption stabilizing of the factors income balance (that is supposed to be positive as well, as consumption of households that benefit from incomes from their overseas assets do not depend only on their domestic yields.¹¹

Our problem however, at the regional level, in decomposing the variance of $GDPgr$ for EU regions, was besides (7) that even for (5) we were only able to estimate the β_1 parameters. All the information available was for Gross Fixed Capital Formation (broadly, investment) defined for a maximum of 162 EU regions over the period 1995-2001,¹² and of course for the corresponding regional GDP, only allowing for the β_1 estimation. Our idea was then to consider that if we produced evidence that β_1 has a significantly lower value for regions than in the cross-countries analysis, that may be seen as a signal of wider trade imbalances for regions, *if we make*

¹¹ Bayoumi *et al.* (1999) proceeds to a direct measure of this mechanism looking at the dispersion of the ratio GNP/GDP through seven of the largest EU countries. As a matter of fact, they also apply the same approach – as a benchmark – to British regions, taking regional personal income as a proxy of GNP . However, personal income is a poorer proxy of GNP than these authors pretend. The ratio of personal income over GDP takes into account several other redistributive effects that operate between households and other institutional sectors inside the same country.

¹² We based our study mainly on NUTS II regions' data, extracted at 29/12/2004, from the Regio database, through the site of the Eurostat (except for Portugal where more complete national statistics were available). Information for regional investment was not available for Spain and UK. For Germany we used NUTS I instead of NUTS II. We excluded countries that are not split by regions at NUTS II level.

the assumption that there is in fact a risk sharing process among regions belonging to a country, as there is within some groups of countries. This hypothesis (that leads to $\beta_3 < 1$) was assumed at the regional level, after it had been statistically confirmed for OECD members, and above all in a more clear way for EU15. In effect, if $\beta_3 < 1$ for regions similarly to countries, and we get a low value for β_1 , then by (5), we should have at the regional level a higher value for β_2 comparing with countries. This would mean that the assumed interregional risk-sharing process is mainly performed through the trade imbalance mechanism. This evidence is consistent with our claim that trade imbalances should be more prevalent for regions than for nations.

The results we obtained for OECD member countries¹³ are reproduced in table 1.¹⁴ The most prominent result is that, unlike our expectations, β_3 is not significantly less than unity for every estimated year, exceeding in fact that value in only 3 out of the 8 years of our analysis.

Table 1: Decomposition of the Cross-Sectional Variance of Shocks on GDP Growth Rates, 1996–2003, OECD Members
(all the variables at constant prices of 1995)

	β_1	β_2	β_3
1996	0.578 (2.788)	-0.559 (-2.200)	1.053 (7.121)
1997	0.434 (3.260)	-0.046 (-0.257)	0.611 (7.069)
1998	0.877 (6.811)	-1.016 (-4.054)	1.045 (10.519)
1999	0.375 (2.452)	-0.116 (-0.541)	0.665 (8.247)
2000	0.192 (1.676)	-0.046 (-0.302)	0.844 (8.202)
2001	0.684 (3.893)	-0.691 (-2.717)	1.032 (8.181)
2002	0.421 (3.153)	-0.126 (-0.763)	0.636 (4.814)
2003	0.386 (2.253)	-0.149 (-0.573)	0.677 (4.147)

¹³ The data we based these estimates were extracted from the site of the OECD at 30/12/2004. The same data have been used for EU15 estimates as well.

¹⁴ As can easily be checked by adding up the β s in Table 1, equation (5) of the main text is not exactly confirmed by these results. The reason for that outcome is that basic macroeconomic identity (1) is not respected itself in the original data, which is to say in the OECD 1995 constant prices data we dealt with. That happens because, in modern National Accounts systems, constant prices aggregates are always, in a first step, estimated at the previous year prices, being the fixed year constant prices values obtained after by a chain-linking process. This procedure, however, generates an unavoidable discrepancy, in what is known in National Accounts jargon by the “additivity problem”. For further discussion of this procedure and of the relevance of the discrepancy, please see Office for National Statistics, UK (2002). Besides this problem, however, in the data we used (source OECD) identity (1) is also infringed at current prices by some countries, namely in a relevant way by Turkey.

This result may cast some doubt on the occurrence of the risk sharing phenomenon itself at cross-country level. Nevertheless, if this kind of behavior does not prevail among OECD countries, that is not because investment does not play its expected role. On the contrary, the investment rate follows clearly a pro-cyclical path ($\beta_1 > 0$ significantly), which would have allowed a strong consumption stabilization, if $\beta_2 < 0$ had not arisen in a systematic way.

In fact, in contrast to our theoretical expectations, there is no evidence that OECD countries resort to external savings to offset adverse and idiosyncratic shocks to GDP. In fact, trade deficits seemed to widen when economies boom and to narrow when growth slows, dominated very likely by the behavior of imports, that very often correlate with the product cycle.

However, if we look at the EU15 instead of the OECD members, the picture we obtain is quite different (table 2). The most outstanding finding for EU15 is that there is now clear evidence that supports the risk sharing phenomenon: that is $\beta_3 < 1$ is significant for most of the years. On the other hand, consistently, external savings, in the broad sense, seem to play its theoretical predicted role in stabilizing countries consumption shares, as we estimated $\beta_2 > 0$ for several years (although these estimates are not statistically significant enough). Furthermore, investment does not follow the same strict pro-cyclical behavior that we found for OECD countries, as we now obtain clear lower values for β_1 than we had before for OECD (β_1 became even negative for a few years, although non-significantly).

In our view, this combination of a mostly stable investment over the cycle with a smooth consumption path may be a signal that EU15 countries can already benefit, almost “like regions,” of an unrestricted access to external savings, turning sometimes into relevant external imbalances by country standards (as is confirmed, for instance, by the Portuguese experience). In fact, it is quite plain from table 2 how different are the results between EU15 in comparison with the OECD countries (all the more so since the OECD comprises the 15 EU countries out of its 30 members).

At the country level, it still is interesting, before proceeding to the cross-regional analysis through the EU, to look, even briefly, at tables 3 and 4, that have the purpose of decomposing β_2

for OECD and EU15 member states, as suggested by equations (6) and (7),¹⁵ The first relevant conclusion in this analysis concerns that $\beta_{21} < 0$ is significant for OECD countries, for several years (table 3), meaning that the current account CA itself, (and so the capital account in the conventional sense) is the reason why external savings do not promote risk sharing among this group of countries. Indeed, our results suggest that international capital markets may have a perverse behavior, tightening the access to external savings when countries do need it more, that is to say when growth slows and recession appears. The same kind of reaction by the capital markets should not arise however among EU15 countries, according to table 4, as β_{21} exhibits for this latter group a reduced value not significantly different from zero (though still negative). If external savings have a role in the EU15, through the trade balances TB , contributing to a risk sharing process, that owes interestingly to the stabilizer role of the factor income balance (β_{23}) and not as might be expected to the transfers operated through the European budget (reflected in β_{22}).

Table 2: Decomposition of the Cross-Sectional Variance of Shocks on GDP Growth Rates, 1996–2003, EU15 countries
(all the variables at constant prices of 1995)

	β_1	β_2	β_3
1996	0.342 (3.498)	0.011 (0.085)	0.646 (7.826)
1997	0.284 (3.203)	0.299 (2.177)	0.532 (7.351)
1998	0.221 (2.455)	0.072 (0.431)	0.654 (7.256)
1999	-0.024 (-0.199)	0.406 (1.910)	0.571 (4.651)
2000	-0.133 (-1.179)	0.453 (2.603)	0.723 (4.694)
2001	-0.186 (-1.012)	0.388 (1.496)	0.774 (3.098)
2002	0.041 (0.197)	0.352 (1.335)	0.633 (4.373)
2003	0.469 (2.691)	-0.186 (-1.161)	0.663 (5.892)

¹⁵ Remark that as happened before with equation (5), equation (7) also comes to be infringed, as adding up β_{21} , β_{22} and β_{23} over the rows of Tables 3 and 4 does not match the corresponding estimates to β_2 at Tables 1 and 2. The reason now is that we could not proceed to this analysis at constant prices, as we have not proper deflators for NT and FI , having we opted instead by using current prices in the decomposition of β_2 . This procedure is justified because we are computing growth rates of ratios, so working at current prices leads to exactly the same results than deflating the numerator and the denominator by the same deflator. The reason for the expressive discrepancy we met over (7) is that being the deflators of TB and C very unlike, it comes that estimating β_2 with nominal values is quite different from using constant prices on $(TB+C)/C$. A second obvious reason for the mismatch in (7) is that in computation of Tables 3 and 4 results we were not able of including all the countries we had used in Tables 1 and 2.

Table 3: Decomposition of β_2 OECD Members¹⁶
(dependent variables at current prices)

	β_{21}	β_{22}	β_{23}
1996	-0.655 (-2.062)	-0.037 (-0.968)	-0.042 (-0.706)
1997	-0.227 (-1.562)	-0.024 (-1.154)	0.158 (2.117)
1998	-1.387 (-6.390)	0.061 (2.230)	0.012 (0.164)
1999	-0.634 (-2.579)	0.052 (2.285)	0.174 (1.749)
2000	-0.675 (-1.722)	0.009 (0.318)	-0.067 (-0.862)
2001	-0.270 (-0.757)	0.098 (2.761)	0.092 (0.560)
2002	-0.465 (-2.285)	0.027 (0.779)	0.131 (1.052)
2003	0.035 (0.104)	-0.069 (-1.602)	-0.028 (-0.463)

Table 4: Decomposition of β_2 EU15 Countries¹⁷
(dependent variables at current prices)

	β_{21}	β_{22}	β_{23}
1996	-0.013 (-0.094)	0.057 (1.634)	-0.063 (-0.715)
1997	-0.302 (-0.206)	-0.016 (-0.487)	0.207 (2.485)
1998	-0.308 (-1.520)	0.010 (0.364)	0.317 (1.776)
1999	-0.037 (-0.174)	0.018 (0.521)	0.426 (2.708)
2000	-0.006 (-0.027)	0.013 (0.416)	-0.028 (-0.270)
2001	-0.096 (-0.534)	0.108 (2.666)	0.355 (2.516)
2002	-0.365 (-1.289)	-0.021 (-0.411)	0.392 (2.415)
2003	-0.285 (-1.324)	-0.017 (-0.574)	-0.073 (-0.668)

As for the regional analysis within the EU, all we were able to do was estimate β_I that stands for the investment impact on the smoothing consumption process. In this procedure, we have excluded Aland, a Finnish archipelago that accounts for only 26,000 inhabitants, and that acted as an outlier. On the other hand, we used GLS instead of OLS, as we had some evidence on different residual variance by countries within our sample of regions (heteroscedasticity)¹⁸.

Table 5 depicts our results that took into account in each year the whole set of regions which we are able to use. Note the low value to β_I , smaller than the one we estimated for countries,

¹⁶ Except Hungary, Turkey and Luxemburg. Japan, Mexico, Poland and Switzerland are excluded as well in 2003.

¹⁷ Except Luxemburg

¹⁸ We have used a White test where the squared estimated residues were regressed on a battery of country dummies, the same equation being used for estimating variances by countries.

whether we dealt with OECD countries, or even in the EU15 case when these estimates were positive. It appears that the absorption of a GDP disturbance that we assumed to exist within the EU, at regional level, as among countries, should have been left to the external savings mechanism (through *TB* imbalances) because empirical data suggest that investment did not carry that burden in any significant way.

After obtaining β_l for the whole set of European regions, we further proceeded with the estimation of the same coefficient for each country separately (although we confined our analysis to countries with at least 10 regions, except for Portugal that only has 7). These countries results, reported in Table 6, confirm that investment does not behave at regional level in a way that induces consumption smoothing, so if that aim is achieved, as we assume it is, it was the trade imbalance mechanism that was compelled to play that role. We even obtained for the most of the time $\beta_l < 0$, although estimates are not, as a rule, accurate enough (samples by countries are too small) for ensuring that they are significantly different from zero.

Table 5: Share of the Cross-Sectional Variance of the GDP Growth Absorbed by the Investment Rate Growth (β_l) EU Regions¹⁹
(investment rate at current prices, regional GDP growth deflated by national deflators)

	β_l
1996	-0.067 (-1.314)
1997	0.128 (2.161)
1998	0.121 (2.539)
1999	0.122 (2.259)
2000	-0.006 (-0.061)
2001	0.225 (1.312)

At last, the available statistical information for EU regions (which confines to investment rates) was able to provide yet other curious stylized fact. Indeed, we found that, despite the fact that regional investment did not reproduce the product cycle, it is notwithstanding a much more unstable variable at the regional level than for countries. When we look at the 162 regions for which data are available at our database, we concluded that in 116 cases we obtained a higher

¹⁹ Except the Spain and UK regions

standard deviation in the regional investment rate than in the country where the region is located (if we had looked at the coefficient of variation instead that number would have been 119). This result may mean that investment is exposed to an exogenous disturbance one that is not correlated with production that should be more relevant for regions than at the country level. If investment shocks do not spill into the regional GDPs and they do not disturb consumption, as we assumed, then the only possible outcome is that they are offset by the external trade, providing a further reason for enlarged trade imbalances.

Table 6: Share of the Cross-Sectional Variance of the GDP Growth Absorbed by the Investment Rate Growth (β_1) for Some European Countries
(investment rate at current prices, regional GDP growth deflated by national deflators)

	Germany	Belgium	France	Greece	Netherl.	Italy	Poland	Portugal
1996	-1.990 (-2.878)	-0.588 (-1.797)	0.191 (2.884)	-1.087 (-1.135)	0.419 (1.327)	-0.226 (-0.712)	-	-8.220 (-1.669)
1997	-1.149 (-1.506)	0.024 (0.047)	0.148 (1.268)	-0.242 (-1.135)	0.990 (2.343)	-0.060 (-0.378)	-	-1.468 (-1.978)
1998	1.626 (2.648)	-0.231 (-0.603)	-0.439 (-3.099)	-0.293 (-0.371)	0.293 (1.264)	0.059 (0.278)	-	-0.933 (-0.970)
1999	-0.305 (-0.415)	-0.160 (-0.363)	-0.188 (-1.449)	-	-0.666 (-4.016)	0.378 (1.199)	-0.072 (-0.363)	3.709 (2.047)
2000	0.941 (2.335)	-0.178 (-0.633)	-0.141 (-1.107)	-	-	-0.313 (-0.991)	-0.178 (-0.427)	-1.350 (-1.986)
2001	0.196 (0.190)	-0.479 (-1.047)	-	-	-	0.505 (1.583)	-	2.230 (1.981)
<i>N</i>	16	11	26	13	12	20	16	7

An interesting additional detail from this analysis is that among the 46 regions (43 if we attend instead to the coefficient of variation) where the investment rate is exceptionally more stable than in the corresponding country, we find 21 out of the 26 French regions. France emerges then as a peculiar case, with a more unstable investment rate for the country than for its regions.

When we have in mind a cross-sectional standard deviation, instead of basing our analysis on time series, we find again a larger disparity among European regions than for countries. The cross-sectional standard deviation of the average investment rate, between 1995 and 2001, for 162 European regions amounts to 0.0549, compared with 0.0250 for the EU15, 0.0352 for the

OECD and 0.0361 for the 19 countries of the EU that are members of the OECD as well. When we calculated however cross-sectional standard deviations within each EU country, we met several cases with a reduced value for that indicator, even below that recorded at EU15. France and Sweden deserve mention for having regularly, in the course of time, cross-sectional standard deviations lagging behind the corresponding statistics for EU15, that in average terms were 0.0178 and 0.0130 respectively. As a matter of fact, the general rule seems to be that the regional disparity on investment rates moved in step with regional asymmetries. For instance, Germany really urged on investing in its laggard regions attaining a cross-sectional standard deviation of the average investment rate of 0.0998 over the period 1995-2001. These interregional disparities should have lead to wide but welcomed trade deficits in that poorest regions.

4. Main conclusions

This paper brought forward a relatively wide set of empirical evidence supporting the idea that regions meet more frequently trade imbalances of relevant size than countries can stand. It would appear that exports and imports are beyond the scope of official statistics, not allowing for a direct computation of trade imbalances. On the other hand, as statistical information on domestic consumption and savings is also unavailable, on a regular basis, for European regions, we were unable to perform even a more indirect assessment of regional external imbalances. With the purpose of overcoming these limitations, we then settled on an approach that makes the proof that investment (basically the information we have at regional level) behaves consistently with our claim of wider trade imbalances for regions, relying on an assumption we deemed reasonable namely that, at regional level, economic agents do smooth consumption in a similar way shown in comparable cross-countries analysis.

Of course, the idea that regions can incur in significant trade imbalances that may be precluded at the country level was also discussed on theoretical grounds. Our main argument was that the sustainability constraints, that limit countries from running important external deficits, do not apply for regions or at least they are not as pressing for them as they are for countries. As regions are free of this sustainability jacket, they become capable of fully profiting from an

efficiency gain that, as we argued, may be provided through external imbalances. In fact, although we cannot say a priori that regions must run trade deficits rather than surpluses, or the opposite (not at least as deficits on some regions have inevitably their counterpart as surpluses somewhere else), we argued that efficiency is improved when capital flows from the regions where it is abundant (generating trade surpluses) to other regions where it is scarce (the less developed ones) causing deficits in these regions. On the other hand, if a region has sound growth expectations, it may also be economically efficient to anticipate consumption at the expense even of a trade deficit.

A related question to our main issue on the relevance of regional trade imbalances is if countries that belong to a monetary union, such as the Euro-zone countries, may to a certain extent be seen to be acting “like regions”, running as well significant but also benign imbalances. This is of course a question with very important policy implications in Europe, because it may lead to the crucial conclusion, against the conventional wisdom, that, in similar fashion for the regions, the external deficits in Euro-countries are innocuous, or at least are not as dangerous as they used to be. As a matter of fact, the preliminary evidence we produced may support that idea, as EU15 countries share the risk associated with idiosyncratic product shocks in such a way that mimics regions’ behavior, and is thus distinct from the OECD countries. In effect, they seem to be more successful on the consumption immunization process after the GDP specific disturbance, without resorting as much to an investment compensating mechanism as would be the case for other OECD countries. The avoidance of a sharp impact on both consumption and investment can only be allowed by a wider access to external savings, at expense of course of more pervasive trade imbalances.

However, we are very cautious about this last conclusion. The widespread feeling of national policy authorities, all over the Europe, is that they should continue to keep a close eye on the external position of their countries. In Portugal, above all, there is currently a great concern about the external current deficit, because it has soared to an unprecedented value for one country during peacetime. On the other hand it must be stressed that, in spite of the empirical evidence we obtained, several theoretical arguments we put forward for regions, showing that they are able to avoid the sustainability constraints, do not apply plainly for Euro-countries. Nevertheless, being careful about radical conclusions for the EU countries does not mean that we

do not accept that in the future, with greater integration, the importance of taming current external imbalances will very likely lessen. Furthermore, if that happens, far from jeopardizing economic growth and development, it will enhance economic efficiency throughout Europe.

References

- Armstrong, H.; Balasubramanyam, V. and Salisu, M. (1996) "Domestic savings, Intra-National and Intra-European Union Capital Flows, 1971–1991" *European Economic Review*, 40, pp. 1229-1235
- Asdrubali, P.; Sørensen, B. and Yosha, O. (1996) "Channels of Interstate Risk Sharing: United States 1963 – 1990" *The Quarterly Journal of Economics*, 111, pp. 1081-1110
- Bayoumi, T. and Rose, A. (1993) "Domestic Savings and Intra-National Capital Flows" *European Economic Review*, 37, pp. 1197-1202
- Bayoumi, T.; Sarno, L. and Taylor, M. (1999) "European Capital Flows and Regional Risk" *The Manchester School*, 67, pp. 21-38
- Catte, P. (1998) "Current Accounts: Are They Still Relevant For and Within a Monetary Union?" in *Current Account Imbalances in East and West: Do They Matter?* Oesterreichische Nationalbank, Vienna
- Coakley, J.; Kulasi, F. and Smith, R. (1998) "The Feldstein-Horioka Puzzle and Capital Mobility: A Review" *International Journal of Finance and Economics*, 3, pp. 169-188
- Decressin, J. and Disyatat, P. (2000) "Capital Markets and External Current Accounts: What to Expect from the Euro" *IMF Working Paper*, WP/00/154
- Dekle, R. (1996) "Saving-Investment Associations and Capital Mobility: On the Evidence from Japanese Regional Data" *Journal of International Economics*, 41, pp. 53-72
- Feldstein, M. and Horioka, C. (1980) "Domestic Saving and International Capital Flows" *Economic Journal*, 90, pp. 314-329
- Helliwell, J. and McKittrick, R. (1999) "Comparing Capital Mobility Across Provincial and National Borders" *The Canadian Journal of Economics*, 32, pp. 1164-1173
- Knight, M. and Scacciavillani, F. (1998) "Current Accounts: What Is Their Relevance for Economic Policymaking?" *IMF Working Paper*, WP/98/71
- Krugman, P. (1989) "Differences in Income Elasticities and Trends in Real Exchange Rates" *European Economic Review*, 33, pp. 1031-1046
- Obstfeld, M. and Rogoff, K. (1996) *Foundations of International Macroeconomics*, The MIT Press, Cambridge, MA, London, UK
- Office for National Statistics, UK (2002) "Annual Chain-Linking in the UK National Accounts – Draft" Seminar "Introduction of Chain Indices in National Accounts", Luxembourg, unpublished
- Ramos, P. (2000) "The Regional Accounts of the General Government: An Application to Portugal" *Journal of Economic and Social Measurement*, 26, pp. 153-171
- Sargento, A. and Ramos, P. (2003) "Input-output Based Methodology for the Estimation of Interregional Trade Matrixes in Portugal", 50th Annual North American Meetings of the Regional Science Association International, Philadelphia, USA, unpublished

- Sørensen, B. and Yosha, O. (1998) "International Risk Sharing and European Monetary Unification", *Journal of International Economics*, 45, pp. 211-238
- Thirlwall, A. (1980) "Regional Problems are «Balance-of-Payments» Problems", *Regional Studies*, 14, pp. 419-425
- Thirlwall, A. and Hussain, M. (1982) "The Balance of Payments Constraint, Capital Flows and Growth Rate Differences between Developing Countries" *Oxford Economic Papers, New Series*, 34, pp. 498-510
- Ventura, J. (2003) "Towards a Theory of Current Accounts" *World Economy*, 26, pp. 483-512.