

THE INCOME INTER-REGIONAL REDISTRIBUTION AND THE INCOME SPATIAL STABILIZATION EFFECTS: AN APPLICATION TO PORTUGAL

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Abstract:

The main idea of this paper is that although the per capita regional GDP is a good indicator of regional income according to its place of generation, it cannot take into account the redistribution process that comes after production, and that may be very significant at the regional level. The paper focuses then on the transformation of the regional product on the adjusted disposable income of the households, and on the different redistributive flows that proceed with that transformation. It has two distinct parts. Firstly we adopted a synchronic analysis where we deal with the so-called income inter-regional redistribution process. In this part we wonder how the regional income inequalities, that are the outcome of the different locations of production, are smoothed when the income falls into the hands of the households (or if the contrary happens, how they are amplified). The identification and the estimation of the weights of the different channels through which that lessening (or amplifying) process acts is an essential part of the work. In a second part ahead we turn to a dynamic approach where we focus on the spatial stabilization of the income effect. At this point our purpose is rather to look at the shocks on the regional product, and to discuss how they can be absorbed (or not) when the production income is transmuted into the regional adjusted disposable income of the households. The degree and the channels of risk sharing (as this absorption process is named too) are also estimated.

Key Words: Inter-regional redistribution; spatial stabilization; risk sharing; cross-sectional variance

1. Introduction

The Gross Domestic Product per capita (GDPpc) is the most common indicator of economic welfare, both at the countries and at the regional level. However, the GDP is the source of all the income produced all over the economy, comprising the yields of all its institutional sectors: households of course, but also societies, general government units, and so on. Indeed, in our view, what really matter at the economies is people – that means households. As a consequence, in the analysis of income distribution we are going to proceed to, our approach will favor the households' income alone, or the personal income as we call it as well, excluding the other kind of institutions (that furthermore, as a rule, do not account significantly as income recipients at last resort).

On the other hand, even when we already look at personal income what is really important for the households welfare is not the so-called Primary Income (the one that is received by virtue of their direct participation in the production process), but the income that actually households benefit. In fact, beyond the compensations by the use of their production factors, households engage as well in a secondary redistribution process of the income, paying taxes, profiting from social benefits, receiving and paying a miscellaneous of other transfers from/to the other institutional sectors of the economy. It is through this secondary redistribution process that the Primary Income is then converted into the Disposable Income of the Households.

Besides, households' economic welfare does not depend exclusively on monetary income, as the one essentially gauged by their Disposable Income. In several countries, governments (and non-profit institutions) provide a multitude of goods and mainly services in kind that households access free of charge or at a trifling price. In other countries, however, people must pay by almost everything they consume. Of course, this makes a difference. This is the reason why the distribution of income in kind, as this one, must be taken into account in view of the households' welfare. When these social transfers in kind are added up the Disposable Income transforms into the Adjusted Disposable Income of the Households.

The main idea of this paper is then that it may exist, remarkably at the regional level, a considerable mismatch between the GDPpc and the income that households actually benefit. The Adjusted Disposable Income of the Households Gross per capita (AGDIHpc)¹ is the measure of income in which we focus our attention on. Ramos (1996) gave two main reasons why regional per capita income measures may be so distinct from GDPpc: one is that commuters, that may reach a huge number among regions, bring their income home, which they generated elsewhere, in other regions. The other is that multiregional or multinational firms operating inside one region, may amount to a significant share of its GDP, but distribute the correspondent incomes – dividends, interests and so on – to those residing outside the region or even abroad. Of course, both of these arguments may apply to countries analyses as well, but it is plain that they are of great consequence mainly for regions. Behrens (2003) in a statistical note published by the Eurostat made the same point, concluding that GDPpc in an inappropriate measure of regional economic welfare.

As a matter of fact, this paper looks at the regional mismatch between the GDPpc and our income variable, the AGDIH, adopting two different perspectives. In a first step, we deal with the issue of the extent to which observed regional GDPpc disparities are reproduced (or not) at the AGDIH level, on a synchronic basis. We are also seeking at once which channels smooth those GDP disparities – if this is the case – when that product is distributed to the households, or on the opposite – if that happens – how those disparities can be amplified. We are dealing in this stage with what we called the “inter-regional distribution of income”.

In a second part of this paper, we adopted instead a dynamic approach, checking how the households succeed in stabilizing their Adjusted Disposable Income, after their region has been hit by a GDP shock. This means that we are then focusing on the growth rates instead of the levels of the aggregates. We called this analysis of “spatial stabilization of income”. This effect is also named risk sharing, as the original shocks at production level spread into other regions while product is transformed into income. We are interested, of course, as well, in the risk sharing channels that are the mechanisms that allow that automatic stabilization over space of the adjusted disposable income.

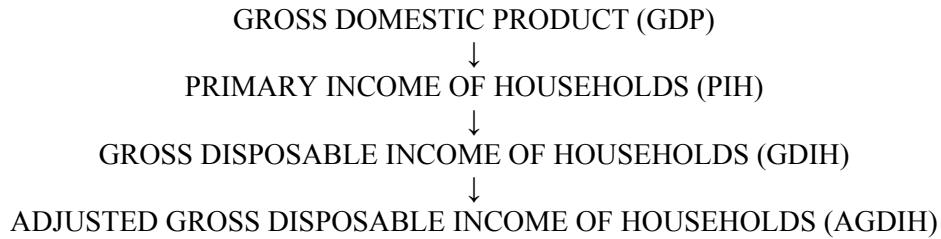
The purpose of this article is to explore these ideas, applying them to the Portuguese NUTS III regions, on the years of 2002 and 2003. Our analysis is mainly founded in the pioneering works of Asdrubali *et al.* (1996) and Sørensen and Yosha (1998), although these authors mostly focused on the inter-regional risk sharing, or as we call it as well on the income spatial stabilization effect. The dichotomy between inter-regional income distribution and spatial stabilization of income, that we have adopted, was proposed by Mélitz and Zumer (1998) and Decressin (1999). After their early works, Asdrubali, Sørensen and Yosha went on searching the same topic (Asdrubali and Kim, 2004; Sørensen *et al.*, 2004; Sørensen *et al.*, 2005). Other relevant contributions may be seen as well in von Hagen and Happ (2001), Kim *et al.* (2003), Jüßen (2006) and Andersson (2008)².

¹ Primary Income, Secondary Distribution, Disposable Income and Adjusted Disposable Income are all National Accounts standard concepts. The official definitions of these aggregates applying to Portugal are provided by the European System of Accounts (Eurostat, 1996a).

² The majority of these articles do not remain in their analyses at the households' income level, but they step down into the per capita consumption expenditure. In fact, we might argue that the consumption is the very last purpose of everybody, so it should be our focus. However, in Portugal neither do we have that information, nor it can be estimated in our opinion in a reliable way. On the other hand, even if we had so it would be debatable anyway that we should go so far. Although the consumption is really the

Figure 1 ahead summarizes our reasoning scheme (based on the sequences of accounts of official National Accounts systems) that beginning with production, that at last resort generates all the income, goes through the income distribution process until reach the AGDIH. This scheme applies both to the “inter-regional distribution of income” and to the “spatial stabilization of income” effects.

Figure 1
From Gross Domestic Product until the
Adjusted Gross Disposable Income of Households



It is important to remark that although all the aggregates of Figure 1 are National Accounts concepts, they are not available at NUTS III regional level (except GDP) in the official Portuguese statistics. Portuguese (and as a rule European) Regional Accounts only reach NUTS II for the majority of these indicators. The data by NUTS III that we deal with in this paper were then built by us, taking advantage of our past or present experience as statisticians in that area. The starting point on these estimates were the Portuguese NUTS II Regional Accounts, having then we followed, for stepping down to the NUTS III level, as close as possible, the same rules and proxies used in the official production of the NUTS II statistics³. This is the reason why this paper confines to only two years: 2002 and 2003.

The following two sections of this paper deal with each one of our two types of effects we considered above: section 2 with the “inter-regional distribution of income” and section 3 with the “spatial stabilization of income” effect. Throughout these sections we describe our empirical approach that consists in decomposing the cross-sectional variances of the level of GDPpc (of its log) and of the GDPpc growth rate. This methodology allowed an identification of the channels through which our two effects act, beyond measuring the actual strength of both. Section 4 summarizes our main conclusions.

2. The inter-regional distribution of income

This section tracks down a double purpose. On the one hand, we wonder if the regional GDP disparities, at NUTS III level in Portugal, are really lessened when the income fall into the hands of the households, forming their Adjusted Disposable Income. On the other, we aim to gauge the weights of the different channels that may produce that smoothing process (if it happens).

Our methodological approach – inspired in the pioneering works of Asbrubali *et al.* (1996) and Sørensen and Yosha (1998) and in the ensuing literature – is based on a cross-sectional variance analysis.

Our starting point is the identity (1) below, that follows the logical scheme of Figure 1:

$$(1) \quad \frac{GDP_i}{Pop_i} = \frac{GDP_i}{PIH_i} \cdot \frac{PIH_i}{GDIH_i} \cdot \frac{GDIH_i}{AGDIH_i} \cdot \frac{AGDIH_i}{Pop_i}$$

final aim of the households, that does not mean it is their purpose at every moment. Future consumption grants welfare as well, when households look over their entire life cycle. As savings is the tool for ensuring that future consumption, then it comes that in a given moment saving itself generates welfare. As a result we may choose to look at AGDIHpc – as we are going to do in fact in this paper – even beside the practical point of the non-existence of proper data for dealing with consumption.

³ These rules are the scope of several methodological documents: Eurostat (1996b, 1996c and 1999)

where i refers to the NUTS III region and Pop means the regional population.

Taking logs in equation (1), we can then reckon the cross sectional variance of GDPpc by:

$$(2) \quad \text{var}\left(\log \frac{GDP_i}{Pop_i}\right) = \text{cov}\left\{\log \frac{GDP_i}{PIH_i}, \log \frac{GDP_i}{Pop_i}\right\} + \\ + \text{cov}\left\{\log \frac{PIH_i}{GDIH_i}, \log \frac{GDP_i}{Pop_i}\right\} + \text{cov}\left\{\log \frac{GDIH_i}{AGDIH_i}, \log \frac{GDP_i}{Pop_i}\right\} + \\ + \text{cov}\left\{\log \frac{AGDIH_i}{Pop_i}, \log \frac{GDP_i}{Pop_i}\right\}$$

Dividing both sides of the equality (2) by the total variance of GDPpc, we get:

$$(3) \quad 1 = \beta_1 + \beta_2 + \beta_3 + \beta_4$$

where:

$$\beta_1 = \frac{\text{cov}\left\{\log\left(\frac{GDP_i}{PIH_i}\right), \log\left(\frac{GDP_i}{Pop_i}\right)\right\}}{\text{var}\left(\log \frac{GDP_i}{Pop_i}\right)}$$

and the other β s are the equivalent ratios for the other covariances. Please note that by definition the β s are as well the slopes of the OLS regressions of the logs of the parts in (1) on the log of GDPpc.

Clearly if AGDIHpc disparities among regions are fully independent of GDPpc asymmetries, then $\text{cov}\left\{\log \frac{AGDIH_i}{Pop_i}, \log \frac{GDP_i}{Pop_i}\right\} = 0$ and $\beta_4 = 0$ as well. That would mean that the

redistribution income process to households lavishly spread over space, insofar that the locals of generation of the income loose any influence on regional AGDIHpc. When, on the contrary $\beta_4 = 1$, regional GDPpc disparities are fully mirrored on AGDIHpc, and any smoothing process among regions did occur. If in the intermediate case we have $0 < \beta_4 < 1$, the regional distribution of the AGDIH is not fully exempted from the influence of the location of the production process, so the inter-regional redistribution process operates partially only. Thus, $1-\beta_4$ is to be regarded as a measure of the degree at which inter-regional distribution of income actually worked. β_1 , β_2 and β_3 (that by (3) equal $1-\beta_4$) are of course the different channels of that inter-regional distribution process.

When β_1 is positive and significantly different from zero, we may conclude that the reduction of disparities among NUTS III, felt at the AGDIH level, has been reached at least in part at the expense of the primary distribution of income. The inequalities in regional GDPpc were absorbed by the variability of the income of the other institutional sectors not distributed to the households, and/or are mixed up among the regions by the cross-participations of the residents in ones regions in other regions' production processes.

When we have (instead or additionally) β_2 positive we may then assert that it was secondary redistribution of income that played that role of reducing disparities. That effect was performed by the taxes and social benefits (and other kind of transfers) system. On its turn, if $\beta_3 > 0$, that means that were the social transfers in kind that softened the original income asymmetries. Table 1 depicts our estimations of these β s.

Table 1: Decomposition of the cross-sectional variance of log GDPpc, 2002 and 2003, Portuguese NUTS III

Anos	β_1	β_2	β_3	β_4
2002	0,349	0,181	- 0,041	0,511
	(4,563)	(4,160)	(-0,762)	(8,077)
2003	0,391	0,161	- 0,024	0,472
	(4,981)	(3,399)	(-0,513)	(7,483)

In this table, as in the others ahead, t-ratios are given in parentheses. As we expected, by (3), the β s exactly added up 1 in each year (although we did not introduce any a priori constraint). The results are rather similar for both years.

The main conclusion is that it does exist an inter-regional redistribution process of income among Portuguese NUTS III regions. As far as β_4 is at the same time significantly different from 0 and 1, we can then say that the regional GDPpc disparities have an influence, but they are largely reduced, when after that distribution process the income take the form of AGDIH. Asymmetries may even have been reduced, at least in 2003, by more than 50%.

As for the shares of the different channels on that inter-regional redistribution process we settled that both the primary distribution and the secondary redistribution of income play a relevant role. The channel of the primary distribution seems to be the more robust one, as β_1 clearly exceeds β_2 . That primary distribution of income effect (β_1) happens among institutional sectors (the other sectors variance protecting households) and/or among regions. This process is seemingly more important at the spatial level than the smoothing effect of the taxes/transfers system, given by β_2 . On the other hand, it looks as though the social transfers in kind have any contribution to the minimization process of regional income disparities, as β_3 took the wrong signal although non-significantly⁴.

As the primary distribution and the secondary redistribution of income (caught by β_1 and β_2) are the main routes that bear the inter-regional benign redistribution of income we confirmed to exist in Portugal, we decided to go further and decompose these effects in finest and more disaggregated channels, that were able to explain this process. We began by the primary distribution of income that led us from the regional GDP to the PIH. The idea was that the primary distribution consists of:

- subtracting the gross operating surpluses (GOS) generated by the production held by the other institutional units (societies, etc.) that is not distributed in that period to the households
- adding up the property incomes (PI) received, less paid, by the households from the rest of the world, comprising in that concept the other regions of the country and the foreigner countries
- adding up the compensation of employees (CE) received, less paid, from the rest of the world
- subtracting the taxes on production and imports, less subsidies (TPLS), that are incorporated in regional GDPs, evaluated at purchasers prices, but are excluded of course from households' incomes.

Having then in mind that:

$$(4) \quad \text{PIH}_i = \text{GDP}_i - \text{GOS}_i + \text{PI}_i + \text{CE}_i - \text{TPLS}_i$$

It comes that (1) may be transformed into:

$$(5) \quad \frac{\text{GDP}_i}{\text{Pop}_i} = \frac{\text{GDP}_i}{\text{GDP}_i - \text{GOS}_i} \cdot \frac{\text{GDP}_i - \text{GOS}_i}{\text{GDP}_i - \text{GOS}_i + \text{PI}_i} \cdot \frac{\text{GDP}_i - \text{GOS}_i + \text{PI}_i}{\text{GDP}_i - \text{GOS}_i + \text{PI}_i + \text{CE}_i} \cdot \frac{\text{PIB}_i - \text{GOS}_i + \text{PI}_i + \text{CE}_i}{\text{PIB}_i - \text{GOS}_i + \text{PI}_i + \text{CE}_i - \text{TPLS}_i} \cdot \frac{\text{PIH}_i}{\text{GDIH}_i} \cdot \frac{\text{GDIH}_i}{\text{AGDIH}_i} \cdot \frac{\text{AGDIH}_i}{\text{Pop}_i}$$

Taking logs and reckoning the cross-sectional variance of GDPpc in the same way than in (2), we then reach:

⁴ One reason why social transfers in kind seem not to contribute to the reduction process of disparities may be that in regionalizing that flow we considered the place where the services are rendered and not the actual place of residence of the beneficiaries. In many cases, education or health services, or other transferred in kind to the households, concentrate in some regions – sometimes the urban richest ones – but their benefits surpass the borders of these regions reaching the peripheral poorer other ones.

$$(6) \quad 1 = \beta_{11} + \beta_{12} + \beta_{13} + \beta_{14} + \beta_2 + \beta_3 + \beta_4$$

where β_{11} until β_{14} are calculated in the same way than in (3), with the covariances of the logs of the parts in (5) with the log of the GDPpc. Note that $\beta_1 = \beta_{11} + \beta_{12} + \beta_{13} + \beta_{14}$, and the remaining β_s shall keep the same values than in our previous estimations reported in Table 1.

Table 2 shows then the decomposition of the cross-sectional variance of the GDPpc, extending further the identification of the channels of the inter-regional redistribution of income, taking into account the different types of flows that lead from GDP to PIH. The β_1 channel splits then in β_{11} , β_{12} , β_{13} , and β_{14} .

Table 2: Decomposition of the cross-sectional variance of log GDPpc, with β_1 split, 2002 and 2003, Portuguese NUTS III

Anos	β_{11}	β_{12}	β_{13}	β_{14}	β_2	β_3	β_4
2002	0.194	0.019	0.071	0.065	0.181	- 0.041	0.511
	(4.000)	(1.590)	(2.343)	(4.498)	(4.160)	(-0.762)	(8.077)
2003	0.209	0.034	0.074	0.074	0.161	- 0.024	0.472
	(4.027)	(2.098)	(2.470)	(4.889)	(3.399)	(-0.513)	(7.483)

The conclusion is that all the process of primary distribution of income has an impact on the inter-regional redistribution of income, except perhaps the property income received (less paid) from the rest of the world (β_{12}), mainly in 2002. The most impressive effect is the retained income by the other kind of institutions but households (β_{11}). That non-distributed income seems to mimic the GDP asymmetries, absorbing them before the income fall into the hands of the households. However, both the taxes on production less subsidies (β_{14}), and the net compensations received from the rest of the world (β_{13}), play a significant role as well in the smoothing of the income inequalities among the households residing in different regions.

On the other hand, in a second stage we decided to decompose as well the smoothing impact of the secondary redistribution of income that transforms the PIH into the GDIH (β_2). These calculations were performed as follows:

$$(7) \quad \text{GDIH}_i = \text{PIH}_i + \text{SB}_i - \text{SC}_i - \text{TIWH}_i$$

where SB are the “Social benefits other than social transfers in kind received by households”, SC the “Social contributions paid by (or on behalf of) households”, and TIWH are the “Current taxes on income and wealth due by the households”⁵.

Adopting a similar procedure to the one that led to decomposition of β_1 in (6) we then get:

$$(8) \quad 1 = \beta_1 + \beta_{21} + \beta_{22} + \beta_{23} + \beta_3 + \beta_4$$

As in the case of the primary income we must have $\beta_2 = \beta_{21} + \beta_{22} + \beta_{23}$, and the remaining β_s shall keep the same values reported in Table 1.

Table 3 gives then our results of the decomposition of the cross-sectional variance of the GDPpc, splitting β_2 into β_{21} , β_{22} and β_{23} .

Table 3: Decomposition of the cross-sectional variance of log GDPpc, with β_2 split, 2002 and 2003, Portuguese NUTS III

Anos	β_1	β_{21}	β_{22}	β_{23}	β_3	β_4
2002	0.349	0.104	0.005	0.072	- 0.041	0.511
	(4.563)	(3.439)	(0.363)	(4.731)	(-0.762)	(8.077)
2003	0.391	0.088	0.003	0.070	- 0.024	0.472
	(4.981)	(2.826)	(0.175)	(4.460)	(-0.513)	(7.483)

⁵ As a matter of fact we did not take here into account the Other Current Transfers, received less paid, by the households, that amount to a very small value, because we did not find a proper proxy for regionalizing them at NUTS III level.

The outcome of this new decomposition of the cross-sectional variance of the GDPpc (of its log) is that social benefits – represented by β_{21} – and the taxes on income and wealth – β_{23} – actually account for inter-regional income redistribution process. The poorest regions benefit from this process because very likely poorer people – that reside there in a relevant percentage – receive more social benefits and pay fewer taxes. On the opposite, the richest regions are losers in that redistribution process, as they benefit less from social transfers and they have a higher tax burden. On the contrary, the social contributions due, by the households, (β_{22}) to the social security systems do not seem to play a similar spatial distributive role.

3. The spatial stabilization of income analysis

The spatial stabilization of income analysis is different from the inter-regional redistribution effect, that we dealt with in the precedent section, because the focus now is on the growth – instead of the levels – of the regional incomes. When in our previous analysis the issue was how the richest (poorest) regions become less rich (poor), when we proceeded from the product (that is also the generation of income) to the income that households actually dispose, our point now is how the positive or negative shocks that hit the product are absorbed by the transformation process of that product in income. Note that through this transformation a shock in one region product spreads into the income of other regions too, that being the reason why this phenomenon is known as well by the “risk sharing” analysis.

In this second part of our paper, the starting point is again the same identity (1) of the previous section that emanates from the Figure 1’s scheme. The difference now is that we transform each ratio taking the first differences of the logs (which is the same of their growth rates), leading to the following decomposition of the variance:

$$(9) \quad \text{var}(\Delta \log \frac{\text{GDP}_i}{\text{Pop}_i}) = \text{cov}\{\Delta \log \frac{\text{GDP}_i}{\text{PIH}_i}, \Delta \log \frac{\text{GDP}_i}{\text{Pop}_i}\} + \\ + \text{cov}\{\Delta \log \frac{\text{PIH}_i}{\text{GDIH}_i}, \Delta \log \frac{\text{GDP}_i}{\text{Pop}_i}\} + \text{cov}\{\Delta \log \frac{\text{GDIH}_i}{\text{AGDIH}_i}, \Delta \log \frac{\text{GDP}_i}{\text{Pop}_i}\} + \\ + \text{cov}\{\Delta \log \frac{\text{AGDIH}_i}{\text{Pop}_i}, \Delta \log \frac{\text{GDP}_i}{\text{Pop}_i}\}$$

Dividing again both sides of the equality (9) by the total variance of the growth rate of the GDPpc, adopting a similar procedure to what we made in (2), we get:

$$(10) \quad 1 = \gamma_1 + \gamma_2 + \gamma_3 + \gamma_4$$

where the γ s (likewise the β s) are the ratios of each covariance in (9) by the variance in the left side. When γ_4 is less than 1, revealing a small correlation between the growth rates of the AGDIHpc and of the GDPpc, that means that the shocks on regional GDP are partially absorbed, having only a reduced effect on the AGDIHpc of the regions. It exists therefore risk sharing. $1 - \gamma_4$ is to be regarded precisely as the risk sharing degree among the regions of the country. Thus we have, as a consequence of this spatial stabilization of income process, by (10), that γ_1 , γ_2 or γ_3 or all together must be positive. These γ s are the channels where the spatial stabilization occurs through. When γ_1 is positive we conclude that the risk sharing happened at the expense of the primary income distribution to the households. When it is γ_2 that is positive – also or instead – it is the secondary redistribution of income (the taxes/transfers system) that plays that role of stabilizing the income over space. In the case of γ_3 the spatial stabilization process is performed through the social transfers in kind that transforms the GDIH into AGDIH.

Table 4 depicts the results we obtained for our γ s.

Table 4: Decomposition of the cross-sectional variance of $\Delta \log$ GDPpc, 2002 – 2003, Portuguese NUTS III

Anos	γ_1	γ_2	γ_3	γ_4
2002-2003	0.530	0.023	0.031	0.415
	(5.398)	(0.525)	(0.380)	(3.932)

These results confirmed that as we expected the shocks on regional product are softened by a spatial stabilization of income process, as γ_4 is significantly different from 1 (and from 0 as well, granting that anyway GDP matters to some extent for explaining the variability of the AGDIH). The risk sharing degree exceeds even 58%, that meaning that less of 42% of a GDPpc shock in one particular region is kept inside that very region. However, very interestingly, it becomes patent that it is the primary distribution of income (γ_1) alone that grasps that process of income stabilizing over regions. As for γ_2 and γ_3 , they assume a very low value non-significantly different from zero, preventing the secondary and the in kind distribution from playing this stabilizing role.

As we concluded that it is the primary distribution of income that hold the full charge for the risk sharing process among regions, we decided to focus on that effect splitting it in the same mode adopted in section 2. γ_1 is then substituted by the sum $\gamma_{11} + \gamma_{12} + \gamma_{13} + \gamma_{14}$.

The γ_{11} accounts to the stabilizing effect of variations of non-distributed gross operating surpluses, protecting the households income, while γ_{12} refers to the impact of the fluctuations of the property income received/paid from the rest of the world (including other regions and other countries), and γ_{13} measures the equivalent effect of the compensation of the employees also received/paid from the rest of the world. γ_{14} finally is the part of the primary income effect concerning the fluctuations of the taxes on production less subsidies, that are excluded when we come up to look at the income of the households instead of GDP. The meaning (and the value) of the other γ s is of course the same than in (10).

Table 5 ahead comprises then the decomposition of the cross-sectional variance of the variation of log GDPpc, among the Portuguese NUTS III regions, with the splitting of the primary income effect into its constituent parts.

Table 5: Decomposition of the cross-sectional variance of $\Delta \log \text{GDPpc}$, with γ_1 split, 2002 - 2003, Portuguese NUTS III

Anos	γ_{11}	γ_{12}	γ_{13}	γ_{14}	γ_2	γ_3	γ_4
2002-2003	0.435	- 0.010	- 0.004	0.109	0.023	0.031	0.415
	(7.819)	(- 0.158)	(- 0.786)	(5.464)	(0.525)	(0.380)	(3.932)

Our conclusion is then that the main channel of the households income stabilizing effect among regions is the non-distribution to the households of part of the gross operating surpluses (γ_{11}). Following a sharp variation, positive or negative, in a regional GDPpc the major impact is felt at the other sectors (societies, government) incomes, that do not propel these shocks (at least in the short run) to the households sector⁶. The fluctuation of taxes on production, less subsidies (γ_{14}), that resembles the GDPpc variations, is also a relevant mechanism – although a weaker one given its lower value – on that process of spatial stabilization of income. On the contrary, the distributions of property income and labor compensations from/to the rest of the word (γ_{12} and γ_{13}) do not seem to have a significant impact on the GDP shocks absorption.

4. Main conclusions

The purpose of this paper was to look at the regional effects of the income distribution process that come after the product generation. In fact, the trivial analyses usually based on the regional GDP concept only account for the generation of the income, neglecting its distribution. On the contrary our focus was on the distribution of income ensuing generation, and on its impact at the regional level. We proceeded to our analysis in two steps: the first approach was a synchronic one and consists in wondering if product asymmetries among regions, in a given year (we looked at 2002 and 2003), that arise when it is generated, still remain when income is distributed to the households. The ultimate households' income concept that we adopted in this study, after the entire distribution process was over, was the Adjusted Gross Disposable Income of the Households, defined in the frame of the official National Accounts systems. We refer to this first approach as the “inter-

⁶ This result that the non-distribution of incomes to the households has an outstanding effect on stabilizing their income along GDP shocks is recurrent all over the relevant literature, including the original classic papers of Asdrubali *et al.* (1996) and Sørensen and Yosha (1998)

regional distribution of income”. In our second stage we rather adopted a dynamic approach, raising the issue of how the product variations, or shocks, lead to identical income variations at the AGDIH level, if those shocks are buffered by income distribution, or if on the contrary they may be amplified. We looked in this phase at the 2002-2003 growth rates. This latter approach was named of the “spatial stabilization of income” analysis.

Our main conclusions, referring to the Portuguese NUTS III regions, were based on a methodology of decomposing cross sectional variances, adopted from the relevant literature. We then asserted that:

- The regional asymmetries, in Portugal, are much more lessened as a result of the inter-regional distribution of income, at the AGDIHpc level, than they were before when we looked at the GDPpc of the Portuguese regions.
- These minor asymmetries result both from a benign distribution of primary income and from a fairer secondary redistribution of income too. The former effect may have been produced by several sub-channels: the income retention by other institutions (societies, government units and so on), the compensation of employees received, less paid, from other regions and countries, and the burden of the taxes on production less subsidies all seem to have played a significant role on the income distribution over space. There is, however, less evidence that the property incomes received, less paid, from the rest of the world, played an equivalent role in equalizing the regional incomes. As for the secondary distribution of income, its benign effect on regional income was the result of the taxes on income and wealth and of the social benefits received by households, but the social contributions avoided this flattener role. We did not find evidence as well that the social transfers in kind contributed to an equitable income distribution of income over regions.
- Just as regional asymmetries, product shocks are also absorbed when our focus proceed from the product generation, felt at the GDP level, to the income of the households, gauged by the AGDIH. In other words, distribution of income to the households works as a spatial stabilizer in regard to the disturbances that may hit product.
- This spatial stabilizer effect on households’ regional income was performed, however, by the primary income distribution alone, the secondary distribution and the distribution in kind having been pulled out from this process. In the scope of that primary income effect, the effective channels were the compression of the non-distributed income to the households when negative shocks happened, and in a small scale the decrease of the taxes bearing on the production and imports, net of subsidies.

5. References

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