A COMBINED APPROACH TO ACCESS SHORT TERM CHANGES IN ECONOMIC ACTIVITY OF PORTUGAL AND SPAIN
João Veríssimo LISBOA (lisboa@fe.uc.pt)
School of Economics and Institute of Systems and Robotics – University of Coimbra, Portugal.
Mário Gomes AUGUSTO (maugusto@fe.uc.pt)
School of Economics and Institute of Systems and Robotics – University of Coimbra, Portugal.
Juan PIÑEIRO-CHOUSA (j.pineiro@usc.es)
University of Santiago de Compostela. Facultad de Administración y Dirección de Empresas
Departamento Economía Financiera y Contabilidad, Spain

ABSTRACT
This paper proposes a different method to identify short term changes in economic activity. We use an approach based on the opinions of several reputable Portuguese and Spanish economists about the importance of a set of individual indicators, which are generally agreed to provide an assessment of the economic activity. The purpose of this paper is to determine the relative economic position over a particular period of time in relation to a short/medium term time horizon and to analyze the importance of the opinion of the economist in the characterization of the economic activity. Trimestral data covering the period from 1995 to 2014 (1st semester) was collected using statistics provided by the OECD.StatExtracts for Portugal, and Spain were considered. The results support the idea that the opinions of the economists are important for the characterization of an economy. Although their opinions about the weight of a particular variable in characterization of the level of the economic activity may vary, implicitly, in the long term, all the opinions tend to converge to the same pattern of an economic activity evolution.

KEY WORDS: economic activity, composite indicator, experimental analysis.

1. INTRODUCTION
Fiscal and monetary policies, as well as corporate decisions, require knowledge of economic activity i.e. the overall state of economy taken both at the economic level and at the level of social development. Given the importance of this information for the decision maker it must be possible to supply a clear economic picture at any moment to obtain a suitable scenario of the developments of the economy in a more medium-term perspective. The sheer variety of existing economic indicators makes it difficult to know which indicator should be used to characterize the economic activity, since their individual evolution presents, at time, contradictory signs. Also, relevant information is often not available at the same time, due to the frequency of data collection and the time gap between when data is recorded and when it is displayed. For example, data on Gross Domestic Product (GDP) is only collected on a trimestral bases, although it is common accepted as one of the important variables for economic activity assessment.

It is believed that there is no single and exact way to predict the evolution of the economic activity. Therefore, if recessions are caused by different factors, then there is no unique indicator that can be better than the others to characterize the stage of the economic activity. In this context, there is no single chain of economical symptoms with the ability to predict the evolution of the economy. Although we can find a certain number observed statistics, they not often lead to better prediction of the economic activity. The modern economy suggests that there are systematic short-term changes that are related to long-term structural economical changes which can be used to formulate political decisions. Therefore, it is common practice to analyze different economical series to find
out which ones are more sensitive to periodical changes in order to define a coincident indicator to characterize a particular period of a business cycle. On one hand no general agreement exists with about which series should be used to be representative of the evolution of the economic activity. On the other hand, composite indicators eliminate the possibility of knowledge of a specific pattern of individual variable, which is fundamental for the understanding of the driving factors that influence short and medium term changes in economic activity. Furthermore, subjective judgment by economists and opinion makers in the interpretation of such indicators might also lead to serious differences in the assessment of the economic activity. Thus, it seems to be important to propose an indicator in addition to considering different economic series, it also considers the opinions of reputable experts regarding the relative importance of each indicator in the characterization of the economic activity.

The remainder of this study is organized as follows. In the following section we present a few studies that address the subject. In section 3 we consider the objectives of this study. In the section 4, we give experts’ opinions and present the data collection. In section 5, the procedure and methodology used in this study are given. The analysis and discussion of the results obtained are presented in section 6. Finally, in section 7, we present the main findings and conclusions of this study.

2. BACKGROUND

The majority of the methods used to obtain an economic activity indicator are based on a composite indicators built from a given set of time series of variables considered to be critical for the description of the economy. This approach was used by the National Bureau of Economic Research (NBER) during the 30's consists to analyze a large number of chronological monthly economical series, and to select those ones that have a regular cyclical pattern and therefore the ability to predict the stages of the economy. Different methodologies have been used to deal with this problem, Stock and Watson (1989) proposes a time series stochastic model that seeks to determine the dominant trend based on a set of selected time series used to build the coincident indicator. Altissimo et al. (2001) made use of the Gross Domestic Product (GDP) quarterly information and obtained a monthly time series information through the linear interpolation of the GDP quarterly figures. Dias (2003) developed a coincident indicator that was adopted by the Bank of Portugal for 10 years. This composite indicator included information on retailers and gross volume of sales, levels of production in manufacturing industry, and cement sales for the national market. Rua (2004) also proposed a model using eight time series, GNP, retailer sales volume, heavy vehicles sales, cement sales, an index of the manufacturing industry, family income opinions, new offers of employment and a proxy of the external economic involvement. Assuming that each series can be decomposed into trend, cycle and irregular components, the model was estimated using the Maximum Likelihood method. This model has the advantage relative to the one used by the Bank of Portugal of being available on a monthly bases. Azevedo et al. (2006) proposed a new model based method to obtain a coincident indicator cycle using standard Maximum Likelihood method to estimate trend and common cycle components that characterizes the economic activity.

This approach both provides economic activity information and allows for getting a growth rate indicator. Although the resulting indicator is based on nine key economic time series, it behaves in a way similar to the growth indicator EuroCOIN, which uses as inputs hundreds of time series. More recently, Azevedo (2011) studies the business cycle fluctuations in the context of US economy using time series analysis. This analysis is
extended by Azevedo and Pereira (2013) by investigating the utility of multivariate predictions of smooth growth as an indicator of economic activity as well as to forecast the quarterly Gross Domestic Product.

Composite indicators might therefore appear to be useful economic instrument for the characterization of economic activity. However, it should be noted that they are constructed in a predefined manner, using inputs that might biased the analysis as specific developments of other variables in time drive the economy. Other criticisms of this indicator include how constituent time series are chosen, mainly on the basis of its fitness with the business cycle, and the determination of the weights given to constituent series, also defined either arbitrarily or on a statistical basis, rather than based on the economical theory. Also, the stability of the inputs has fluctuated strongly in recent years, violating one of the main assumptions for the selection of the time series used to build the composite indicator (its stability over time), raising some questions of the usefulness of such indicators in global and more volatile economy (European Central Bank, 2001).

Based on these criticisms, composite indicators do not appear to be very useful for making reliable characterization of the economic activity and should be seen more like a complementary tools, rather than as complete assessment of the economical activity growth. Economists have also an important role in the characterization of the economic activity. Their opinion, although subjective, are based in a set of economical indicators and may not be coincident. These divergences may have origin in differences of political opinions, governmental context or different opinions about the interpretation of statistical information provided by the official sources. Therefore, what it is disseminated to the general public concerning the evaluation of the economic activity it is the result of the combination of economical indicators and the opinion of experts in economic analysis. Therefore, economical indicators by itself should not be used alone to assess the economic activity. This evaluation should be weight with the opinion of different experts. It is the conjugation of these two aspects that are essential for the understanding of the current and near future development of the economic activity.

3. OBJECTIVE OF THE STUDY

In this paper we propose a new methodology to identifying the evolution of the economic activity and the importance of the opinion of the economists in its characterization. Instead of using a set of time series considered to be relevant to describing the economy, our approach is based on the opinions of different reputable economists regarding the importance of a set of individual indicators that are generally accepted to assess the economic activity, in order to determine the relative position of a particular period of time in a short/medium term time horizon. This method has the advantage of not requiring any particular assumption for the individual indicators chosen to characterize the economic activity. Also, it does not require any transformation of the individual economic indicators. Therefore, it does not hide the driving factors behind current and short-term changes in economic activities. Furthermore, it emphasizes information regarding the development of the economy as a whole.

This approach uses a straightforward methodology that considers both the opinions of experts and several relevant indicators to assess the economic activity. In this context, the proposed methodology, unlike traditional composite indicators methodologies, considers that the opinions of the economists about the importance of the different economic variables in the characterization of the economy are also relevant to assessing the level of growth of the economy as a whole. This composite indicator extracts the relevant information allowing us to characterize the state of the economic activity.
Insights gained from this applied research have practical implications to policy-makers and investors, namely it provides reliable information about the evolution of the economic activity.

4. DATA AND EXPERTS’ OPINIONS

The European crisis that has begun in 2008 with severe problems in the banking and financial sector is considered nowadays a crisis of economic growth. Some economists believe that economic growth must be achieved through a structural transformation of the economy, via a balanced budget based on austerity policies. Others authors consider that economic growth should be encouraged through increased public investment, even proposing larger deficit budgets to stimulate demand, create more employment and, consequently, achieve a balanced budget through increased income. These two ways of thinking are reflected in the different weights given by the economists to the indicators used in this study to characterise economic activity (Table 1a and 1b).

The topic of austerity has been always a prolific branch of research, but it has received a notable attention by academics and researchers in recent times, as a consequence of this financial crisis, which has invigorated the discussion around the role of austerity policies.

Austerity aims to decrease a state’s deficit and debt by means of an increase in taxes and a reduction in public expenditure and wages, in order to recover competitiveness. It is claimed that austerity is a requirement in order to guarantee that expenditures from the private sector become more efficient and, that way, they can act as drivers of the recuperation (Fama, 2009) by helping to reduce economic depression (Cochrane, 2011).

However, there is a lot of criticism around these propositions, since austerity has been referred to provoke the opposite effects to those intended (Blyth, 2013). There have been many authors that have investigated these issues. Moreover, it has been stated that the economic dimension of austerity is unavoidably linked, among others, to increased levels of unemployment and poor growth dynamics (Hannsgen, 2012). That is to say that it has a social dimension (Konzelmann, 2012), since it is likely to threat the social stability through long periods of time (Chang, 2012), affecting health conditions (Antonakakis & Collins, 2014; Branas et al., 2015), and with a reduction in education and research expenditure, which has been reported to be incompatible with competitiveness and growth (Calcagno, 2012). In fact, several authors state that other inefficient public expenditure should be reduced in order to increase the public financial commitment in these areas (Ogujiuba & Ehigiamusoe, 2014).

In contrast to those austerity measures, and as a proof that it is possible to retrieve the relative loss of competitiveness in Europe, measures to boost demand and labor policies have proved themselves to result into nominal wage increases, boosting productivity and unemployment rate reduce (Carrasco, 2014). A clear example is the French case, which emphasizes that implementing policies to reduce working hours produce increases in the percentages of employment creation, warning that the concept of financialization and unemployment are two sides of the same coin (Husson, 2015).

Another argument states that as a response to the reduction in government expenditure, according to Keynesian policies, GDP would contract in the short term, but it would expand in the long term, what would reduce the debt / GDP ratio. Specifically, the adoption of Keynesian policies in the dollar zone and the pound sterling area increased the exchange rate of the euro, while they also led to increased deficits in European
countries with low debt-to-GDP ratio (Brady, 2015), considering that the imbalances in the countries of southern Europe are due to domestic and global demand rather than wage differences and problems; that is, it is possible to talk about competitiveness without costs more than about cost competitiveness (Storm & Naastepad, 2015).

For example, analyzing empirically the Spain and Portugal cases, the Stability Plan (ECB&IMF mandatory program since 2010) finally meant the same austere, harsh and drastic measures for both countries. That is, the austerity measures to be applied in order to face the market turbulences are dictated to governments by supranational authorities, leading to a cost for national politicians against their voters. Social cohesion and services are mined and, as the voters are not able to change policies, they opt for changing the government (Dellepiane & Hardiman, 2013).

That is the reason why we must take into account both the preexisting differences among European members’ economies and the intrinsic guidelines of European integration (Cafruny & Ryner, 2007), as well as the dynamic determinants of European integration, such as global economic and financial structures, or the euro and the concept of financialization (Flassbeck & Lapavitsas, 2015), in discussing the concept of “disastrous experiment” on which any amendment would be politically impossible to implement (Lavoie, 2015), making this crisis nor a balance of payments issue, but a faulty link between national governments and the central banks systems encouraged by the guidelines of European integration (Cafruny & Ryner, 2007).

However, even there are authors that consider that those are inadequate austerity measures in times of economic crisis (Kitromilides, 2011), or that the austerity measures adopted in the European economies entailing wage cuts, decreased social welfare or rescue banking can be considered unconventional and unsuitable, they had to be accepted as valid measures in absence of other alternatives (Jäger & Springler, 2015).

Given the different opinion of the economist about the indicators used in characterization of the economic activity, in this study, we propose a methodology based on the explicit statistical information relevant to characterizing the economic activity and the opinions of several economists about the relative importance of the different economical constructs. In a first step, a panel of three Portuguese economists was used to indicate the most important economical variables that can be used to evaluate the state of the economy.

Based on their collected judgment, nine indicators were selected: Gross domestic product (GDP), harmonized unemployment rate, consumer confidence indicator (EC), harmonized consumer price index, exports of goods and services index, total retail trade index, production of the construction sector index, and investment rate (gross fixed capital formation/gross domestic product).

In the second step, a panel of eight well-known Portuguese economists and ten well-known Spanish economists (academicians, politicians and former ministers), were asked to provide their opinions on scale from 0 to 1, regarding the importance of each one of those eight variables to evaluate the economic activity ($w_{ij}$). These weights are presented in Table 1a and 1b. Trimestral data covered the period from 1995 to 2014 (1st trimester) was collected for those nine variables from the statistics provided by OECD.StatExtracts for Portugal and Spain.
Table 1a): Opinions of the Portuguese economists (w_ij)

<table>
<thead>
<tr>
<th>Economist</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>1,00</td>
<td>0,75</td>
<td>1,00</td>
<td>0,80</td>
<td>0,80</td>
<td>0,70</td>
<td>0,50</td>
<td>1,00</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>1,00</td>
<td>0,50</td>
<td>0,90</td>
<td>1,00</td>
<td>1,00</td>
<td>0,90</td>
<td>0,70</td>
<td>0,70</td>
</tr>
<tr>
<td>Confidence indicator</td>
<td>0,70</td>
<td>0,90</td>
<td>0,30</td>
<td>0,60</td>
<td>0,70</td>
<td>0,85</td>
<td>1,00</td>
<td>0,70</td>
</tr>
<tr>
<td>Consumer price index</td>
<td>0,90</td>
<td>0,50</td>
<td>0,50</td>
<td>0,20</td>
<td>0,20</td>
<td>0,75</td>
<td>0,20</td>
<td>0,30</td>
</tr>
<tr>
<td>Exports index</td>
<td>0,80</td>
<td>0,50</td>
<td>0,80</td>
<td>0,60</td>
<td>0,60</td>
<td>0,60</td>
<td>0,90</td>
<td>0,80</td>
</tr>
<tr>
<td>Retail trade index</td>
<td>0,70</td>
<td>0,75</td>
<td>0,50</td>
<td>0,70</td>
<td>0,50</td>
<td>0,60</td>
<td>1,00</td>
<td>0,70</td>
</tr>
<tr>
<td>Prod. Const. sector index</td>
<td>0,70</td>
<td>0,75</td>
<td>0,20</td>
<td>0,40</td>
<td>0,30</td>
<td>0,50</td>
<td>0,80</td>
<td>0,70</td>
</tr>
<tr>
<td>Investment rate</td>
<td>0,80</td>
<td>0,50</td>
<td>0,75</td>
<td>0,70</td>
<td>0,90</td>
<td>0,75</td>
<td>0,20</td>
<td>0,80</td>
</tr>
</tbody>
</table>

Table 1b): Opinions of the Spanish economists (w_ij)

<table>
<thead>
<tr>
<th>Economist</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>1,00</td>
<td>0,70</td>
<td>0,70</td>
<td>0,80</td>
<td>0,70</td>
<td>0,90</td>
<td>0,80</td>
<td>1,00</td>
<td>1,00</td>
<td>0,80</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>1,00</td>
<td>0,90</td>
<td>0,90</td>
<td>0,80</td>
<td>0,80</td>
<td>0,70</td>
<td>0,50</td>
<td>0,70</td>
<td>0,80</td>
<td>1,00</td>
</tr>
<tr>
<td>Confidence indicator</td>
<td>0,80</td>
<td>0,70</td>
<td>0,50</td>
<td>0,20</td>
<td>0,70</td>
<td>0,60</td>
<td>0,70</td>
<td>0,90</td>
<td>0,60</td>
<td>0,70</td>
</tr>
<tr>
<td>Consumer price index</td>
<td>0,50</td>
<td>0,60</td>
<td>0,70</td>
<td>0,70</td>
<td>0,05</td>
<td>0,70</td>
<td>0,60</td>
<td>0,90</td>
<td>0,70</td>
<td>0,90</td>
</tr>
<tr>
<td>Exports index</td>
<td>0,90</td>
<td>0,90</td>
<td>0,70</td>
<td>0,70</td>
<td>0,70</td>
<td>0,90</td>
<td>0,60</td>
<td>0,90</td>
<td>0,70</td>
<td>0,70</td>
</tr>
<tr>
<td>Retail trade index</td>
<td>0,80</td>
<td>0,60</td>
<td>0,70</td>
<td>0,90</td>
<td>0,80</td>
<td>0,00</td>
<td>0,70</td>
<td>0,90</td>
<td>0,90</td>
<td>0,70</td>
</tr>
<tr>
<td>Prod. Const. sector index</td>
<td>0,20</td>
<td>0,60</td>
<td>0,50</td>
<td>0,60</td>
<td>0,80</td>
<td>0,40</td>
<td>0,50</td>
<td>0,80</td>
<td>0,90</td>
<td>0,50</td>
</tr>
<tr>
<td>Investment rate</td>
<td>0,70</td>
<td>0,70</td>
<td>0,80</td>
<td>0,80</td>
<td>0,90</td>
<td>0,00</td>
<td>0,70</td>
<td>0,90</td>
<td>0,70</td>
<td>0,60</td>
</tr>
</tbody>
</table>

5. PROCEDURE, METHODOLOGY AND HYPOTHESES TO BE TESTED

First, we are interested to test the hypothesis if the opinions of the Portuguese and Spanish economists are different concerning the relative importance of the specific set of variables used to evaluate the state of the economy. According to Hicks (1982) to test this hypothesis, the mathematical model for this experiment can be written as

\[ w_{ijk} = \mu + \tau_i + \beta_j + \tau\beta_{ij} + \epsilon_{k(ij)} \]

where:
- \( i = 1, 2 \) for the economists nationality.
- \( j = 1, 2, ..., 8 \) for the set of variables.
- \( k = 1,2,3, ..., 8 \) for the Portuguese panel and \( 1,2,3, ..., 10 \) for the Spanish panel.
- \( w_{ij} \) represents the weight given by the nationality of economist for \( i = 1,2 \) and \( j=1,2,...,8 \), \( \mu \) the common effect for all variables, \( \tau_i \) the nationality of the economist effect, \( \beta_j \) the variable effect, \( \tau\beta_{ij} \) the interaction effect, and \( \epsilon_{k(ij)} \) represents the random error within the sixteen treatments.
The hypothesis to be tested is the following:

**Hypothesis 1:** Are the opinions of the Portuguese and Spanish economists equal concerning the relative importance of the specific set of variables used to evaluate the state of the economy? (H₀: τ₁ = τ₂ vs τ₁ ≠ τ₂).

A significant F statistic will indicate the weights given by the Spanish and Portuguese economists are different.

Second and based on the information given in Table 1a) and 1b), an index (αᵢᵣ) reflecting both the opinion of an economist and the economic activity for each trimester was used as a composite index. For each of two countries this index was calculated as follows:

\[ \alpha_{it} = \sum_{j=1}^{8} w_{ij} \times X_{jt} \]

where,

\[ w_{ij} \] represents the weight given by the nationality of economist for \( i = 1,2 \) and \( j=1,2,...,8 \) as described above (Table 1) and \( X_{jt} \) represents the value of the variable \( j \) in trimester \( t \) with \( t = 1,2,3,...,77 \).

We are interested to test for each country the hypothesis if the opinions of the economists are relevant to the characterization of the economic activity as a whole. Can their feelings about the relative importance of a specific set of variables affect the overall appraisal of the economy? To test this hypothesis, the values of \( \alpha_{ij} \) are going to be treated as experimental units in a single factor experiment with blocks. For each country, the mathematical expression for this design is

\[ \alpha_{it} = \mu + \beta_i + \tau_t + \varepsilon_{it} \]

where, \( \mu \) represents the common effect for all the trimesters, \( \beta_i \) the opinions of the economists, \( \tau_t \) represents the block effect of the \( t \)th trimester and \( \varepsilon_{it} \) represents the random error present in the \( i \)th observation on the \( t \)th trimester. Therefore, using \( \alpha_{ij} \) as an index of a composite indicator that characterizes the economic activity the following hypothesis can be formulated:

**Hypothesis 2a):** Do the opinions of the Portuguese economists differ to the characterization of the economic activity (H₀: \( \beta_i = 0 \) for \( i = 1,2,3,...,8 \))?

**Hypothesis 2b):** Do the opinions of the Spanish economists differ to the characterization of the economic activity (H₀: \( \beta_i = 0 \) for \( i = 1,2,3,...,10 \))?

A significant F statistic will indicate that from an economist to an economist, differences of opinions are detected, namely in the intensity of how each variable contributes for the combined indicator.

### 6. RESULTS AND DISCUSSION

Table 2 shows the results associated with Hypothesis 1. As we can see the results show an \( F = 3.02 < F_{(1,128;0.05)} = 3.92 \). Therefore for a level of significance of 0.05 there is no difference in average between the opinions of Spanish and Portuguese economists.

Concerning **Hypothesis 2a)** and **2b)**, Table 3 shows for the two countries, the correspondents \( F \) values are significantly larger than the corresponding critical \( F \) at five
percent level of significance. These results show that the opinions of the economists about the importance of each variable for the characterization of the economy are different.

Table 2: ANOVA for hypothesis 1

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>MS</th>
<th>df</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationality (τ)</td>
<td>.10</td>
<td>.10</td>
<td>1</td>
<td>3.02</td>
<td>.084</td>
</tr>
<tr>
<td>Variable (β)</td>
<td>1.42</td>
<td>.20</td>
<td>7</td>
<td>6.14</td>
<td>.000</td>
</tr>
<tr>
<td>Interaction (τβ)</td>
<td>.21</td>
<td>.03</td>
<td>7</td>
<td>0.94</td>
<td>0.476</td>
</tr>
<tr>
<td>Error</td>
<td>4.26</td>
<td>.03</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5.99</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: ANOVA for hypothesis 2

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portugal</td>
<td>Economist (β)</td>
<td>2131784.9</td>
<td>7</td>
<td>304540.7</td>
<td>3985.37</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Trimester (τ)</td>
<td>647300.4</td>
<td>76</td>
<td>8517.1</td>
<td>111.46</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>40652.6</td>
<td>532</td>
<td>76.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>Economist (β)</td>
<td>1720915.7</td>
<td>9</td>
<td>191212.9</td>
<td>1925.52</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Trimester (τ)</td>
<td>2568238.1</td>
<td>76</td>
<td>33792.61</td>
<td>340.29</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>67924.5</td>
<td>684</td>
<td>99.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The differences of opinions among the economists can be seen in the intensity of economic activity curve pronunciation by plotting $\alpha_{ij}$ for each economist and for each country (Figure 1a and 1b). This figure shows the differences in the evolution for the different economies. It should be noticed however that although differences of opinions among economist of both countries were detected, in the long run their opinions converge for the same pattern. All the curves have the same configuration, showing clearly that in the long-term all economists have the similar perceptions regarding the evolution of the economic activity.

Figure 1a: Economic activity curve for each economist - Portugal
Averaging the opinions of the Portuguese economists, \( \overline{\alpha}_t = \frac{\sum_{i=1}^{8} \alpha_{it}}{8} \) and \( t = 1,2,3, \ldots, 77 \) and the Spanish economists, \( \overline{\alpha}_t = \frac{\sum_{i=1}^{10} \alpha_{it}}{10} \) and \( t = 1,2,3, \ldots, 77 \) we can observe the evolution of the economic activity for the two countries (Figure 2).

**Figure 1b:** Economic activity curve for each economist - Spain

**Figure 2:** Evolution of the economic activity for Portugal and Spain
The relative position of the evolution of this composite index $\bar{\alpha}_j$ is shown in Figure 2. This figure shows a similar evolution for the different economies although with different timings in inflection points.

The same procedure was used to analyze the evolution of the Portuguese and Spanish economy using the Spanish panel and Portuguese panel of economists, respectively. The results are shown in Table 4. The results show that no matter the economist’s panel access, the results are basically the same. The access of the economic activity for each country remains the same independently of the nationality of the panel of experts. The economists’ opinion is different in how they weight each variable, but in the long run the evolution pattern is the same.

**Table 4:** ANOVA for hypothesis 2 (exchange of experts panel)

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portugal</td>
<td>Economist (β)</td>
<td>1791179.7</td>
<td>9</td>
<td>199018.85</td>
<td>1947.7</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Trimester (τ)</td>
<td>1044558.9</td>
<td>76</td>
<td>13744.2</td>
<td>134.5</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>69893.4</td>
<td>684</td>
<td>102.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>Economist (β)</td>
<td>2089858.8</td>
<td>7</td>
<td>298551.3</td>
<td>2916.2</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Trimester (τ)</td>
<td>1671832.2</td>
<td>76</td>
<td>21997.8</td>
<td>214.9</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>54474.2</td>
<td>532</td>
<td>102.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. CONCLUSION

The methodological approach offered in this study, is different from the traditional approaches for observing the economic activity of a particular country. It has the advantage of being easy. It takes in consideration the opinions of experts rather than just the time series of the economic variables and aggregating in a single indicator $\bar{\alpha}_i$ a measure of the economic activity. In addition, the selection of the economic variables used to reflect the state of the economy was based on the opinions of a panel of notorious economists.

The results support the idea that the opinions of the economists are important for the characterization of an economy. Although their opinions about the weight of a particular variable in characterization of the level of the state of the economy could be different, implicitly, in the long run, all the opinions converge towards the same pattern of the economic activity’s evolution.

Based on these results, there are reasons to believe that economists’ opinions act as opinion makers, although having different opinions regarding the weight of the variables that contribute to explain the level of the economic activity. From a practical perspective, this methodology can be used to access the economic activity of a country, to determine whether the economy is going through a period of expansion or contraction. Using this information, managers and politicians can formulate suitable long-term strategies for enhancing competitiveness and better economic policy decisions.

Future research might consider using larger time series to allow economic activity comparisons and to identify business cycles. The methodology can also be applied to other countries and to different panels of economists to verify the features of the economic activity and to analyse the importance of economists’ views in their characterization.
REFERENCES


