A proposal to measure country risk in OECD countries with MPI index

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ABSTRACT

In the last few years a fast growth of international lending and foreign investment has been happening. As a consequence of the large flow of capital going towards new developing countries, the risk exposure of the lenders and investors is rising, and country risk analysis becomes more and more important for the international financial operators. In the present paper we propose a non-compensatory index to reckon the country risk (since now, CR) in OECD countries: the Mazziotta Pareto Index (MPI). It assumes the “non-substitutability” of the dimensions, all of them being considered of the same importance, without any compensation possible among them. Our indicator classifies the Ocse countries into six main groups, according to their high or low country risk. Although based on a small number of variables, the MPI can to assess quite correctly the pre-figurative “latent dimensions” of the CR in the short run. The proposed index sheds light particularly on the risk linked to political-economic decisions, and on the public finance. Our CR Index allows to assess international country risk ratings comparatively, and to single out the relevance of economic, financial and political risk as components of a general risk rating.

KEYWORDS

Country Risk Index, MPI, Non compensative index, OECD countries, political risk

INTRODUCTION

As the international debt of less developed countries grew rapidly in the 1970s and the incidence of debt rescheduling increased in the early 1980s, the international financial community has been concerned with country risk, which reflects the ability and willingness of a country to meet its financial obligations (Cosset and Roy, 1991) and international rating agencies have begun to measure the credit risk involving sovereign countries (Hoti and McAleer 2004). Risk rating agencies use different methods to calculate country risk ratings, by combining a wealth of qualitative and quantitative information related to alternative measures of economic, financial and political risk into associated composite risk ratings. However, it is
possible to question the accuracy of any risk rating agency in determining any or all of these measures.

Nowadays the concept of "country risk" has become topical once again. The first and the most obvious reason for this is the intensifying process of globalization, which created a new economic and political setting. One more reason for the renewed interest is the recent sovereign and private debt crises in many of the European countries (both EU and not EU member states), including some of those that are part of the Euro zone. Furthermore, the aftermaths of the financial crisis spread all around the world (San-Martín-Albizuri, and Rodríguez-Castellanos, 2017).

Finally, governments too are involved in this process, since their actions can often impact country risk directly. Increased country risk often translates into less foreign investment in the country, and leads to lower economic growth and potential political turmoil, which in turn may cause and increase in country risk.

CR covers a mix of risks, which may reveal unsustainable, that emerge when financial or commercial exchange flows arise, or investments are made in a foreign country (Ivaldi 2013). Such an ample definition adapts to different investment strategies and includes all the areas at risk coming up when an investment is made outside one’s own country. CR assessment is extremely complex. In order to get it, one must collect and elaborate widespread information and quantitative data. In doing that, the “subjective” judgement is inevitably relevant.

CR is different from sovereign risk, because CR assesses the political and economic factors of a borrowing country that might interrupt the timely repayment of principal and interest whilst sovereign risk consists in the credit risk of a sovereign government as a borrower (San-Martín-Albizuri, and Rodríguez-Castellanos, 2017).

The results of a country risk analysis can be employed as tools to make both pre-lending and post lending decisions. Before lending, the measured risk is the base to decide whether or not to lend, how much to lend, and how much risk premium to charge. After lending, the periodic country risk check is a monitoring action and provides a pre-warning system (Nath 2008).

Country risk analysis dates back to the end of the sixties, when Avramovic et al (1968) at the World Bank undertook a systematic analysis of factors affecting a country’s balance of payments and, therefore, its ability to service external debt. They suggested to evaluate a country’s capacity to service debt by using a combination of short-term and long-term indicators.

In the studies on country crises throughout time, the methods applied are different: e. g., the variable selections through the principal component analysis, which allows the reduction of variables to include in the index in a new mix of “latent” variable rundowns, (Levy and Yoon 1996); the construction of a CR index on the level of geographical areas (Carment 2001); the MHDIS (Multi-group Hierarchical Discrimination) analysis by Doumpos and Zopounidis (2002), which compares different analysis methods for developing countries; the two different models by Hammer et al. (2004): the first one based on multiple linear reversion, and the second that uses a logical analysis of data technique (LAD).

In the 1960s and 1970s CR was calculate only on qualitative types of studies but from the 1980s the studies have become markedly quantitative, to forecast default danger or financial crisis. However, also sophisticated quantitative approaches can be incapable to account for phenomena not precisely described by numbers (Ivaldi and Di Gennaro 2011). Indeed, the CR must be interpreted on the basis of a multidimensional approach, considering both well-known risks, such as macroeconomic fragility and geopolitical risks (Meldrum 2000). Nath (2008) argues for the necessity to enlarge the field of analysis, create more fitting models, and face
new challenges, Cukier and Mayer-Schoenberger (2013) underline the new researchers’ ability of using “big data”.

In the present paper we propose a non-compensatory index to reckon the country risk in OECD countries: the Mazziotta Pareto Index (MPI). It assumes the “non-substitutability” of the dimensions, all of them being considered of the same importance, without any compensation possible among them. Not only does it consider quantitative variables, but also qualitative elements, which play there a key role. Although based on a small number of variables, the MPI can to assess quite correctly the pre-figurative “latent dimensions” of the CR in the short run. Finally, we provide some additional considerations about the year of analysis.

VARIABLES SELECTION

Literature is divided about which algorithms are to be used to select the variables to include in the analysis, taking into account that the choice is trained also by the obtainability of data. This impacts on the choice and, therefore, on the composition of the indicator itself (Ivaldi et al 2016a, Ivaldi et al 2016b), and by the purposes of the indicator (Soliani et al. 2011a, 2011b, Testi and Ivaldi 2009, Carstairs 2000, Gordon and Pantazis 1997, Carstairs et Morris 1991, Jarman 1983). In general, the study must avoid the risk of considering separately dimensions that are really similar, incurring in overlaps.

First of all it’s appropriate to construct an index based on currently available data, which do not require ad hoc surveys, with the double result of avoiding the creation of additional costs and of being allowed to update indexes in a simple and continuous manner, basing decisions on objective and transparent data coming directly from certified sources (Jarman 1983, 1984; Forrest and Gordon, 1993; Gordon and Pantazis 1997, Townsend 1987).

To define the field of research, we have done a first test on data supplied by official research bodies and statistical institutions (Ivaldi and Testi 2010). The study concentrated on a mix of variables dependable with the choices of most of literature (Carment 2001, Doumpos et al. 2001, Hammer et al. 2004; Doumpos and Zopounidis 2002; Levy and Yoon 1996, Ivaldi and Di Gennaro 2011).

Table 1. Variable selected (Sources of variables: *World Bank, **Marsh 2015)

<table>
<thead>
<tr>
<th></th>
<th>Variable selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Government deficit/Surplus*</td>
</tr>
<tr>
<td>2</td>
<td>Employment to population ratio, 15+, total (%) *</td>
</tr>
<tr>
<td>3</td>
<td>Central Government Debt as a % of GDP*</td>
</tr>
<tr>
<td>4</td>
<td>Population Growth Rate Annual*</td>
</tr>
<tr>
<td>5</td>
<td>Total reserves (includes gold, current USS) (% GDP)*</td>
</tr>
<tr>
<td>6</td>
<td>Exports of goods and services (% of GDP)*</td>
</tr>
<tr>
<td>7</td>
<td>Net Migration (% pop tot)*</td>
</tr>
<tr>
<td>8</td>
<td>GDP growth (annual %)*</td>
</tr>
<tr>
<td>9</td>
<td>Gini Index*</td>
</tr>
<tr>
<td>10</td>
<td>Inflation, consumer prices (annual %)*</td>
</tr>
<tr>
<td>11</td>
<td>Political Risk**</td>
</tr>
<tr>
<td>12</td>
<td>Human Development Index (HDI)*</td>
</tr>
</tbody>
</table>
METHOD

To select indicators principal component analysis (PCA) has been applied. With principal component analysis, it's possible to partition the total variance by first finding the linear combination of the variables that accounts for the maximum amount of variance:

\[ y_1 = a_{11}x_1 + a_{12}x_2 + \cdots + a_{1p}p \]

where \( y_1 \) is the first principal component (Johnson and Wichern, 2002). The method proceeds by finding a second linear combination, not correlated with the 1st component, such that it explains the next largest quantity of variance in the system, after the variance referred to the 1st component has been removed. The equation of the 2nd component is:

\[ y_2 = a_{21}x_1 + a_{22}x_2 + \cdots + a_{2p}p \]

The procedure goes on in this way. Thus, the use of principal components allows creating a set of uncorrelated variables (the components) by transforming a set of correlated variables. It means that the Pearson correlation between the components is equal to 0 (Pituch and Stevens, 2016).

Principal Component analysis aims to summarizing information contained in a matrix of correlation or variance / covariance, and tries to statistically identify their latent and not directly observable dimensions (Stevens 1986). If two variables are highly correlated to the same component, a significant proportion of the correlation between the two variables is explained by the fact that they have common factors (Dillon, Goldstein 1984).

In a non-rotation solution any variable is explained by two or more common factors, whereas in a rotation solution any variable is explained by one single common factor (Johnson and Wichern, 2002). A number of analytic rotation methods have been developed, (Krzanowski and Marriott, 1994, Fabrigar et al., 1999) depending upon whether the factors are believed to be correlated – oblique - or uncorrelated - orthogonal - (Gorsuch 1983, Abdi 2003). Subsequent extraction and rotation algorithm tests revealed stability of the components extracted as well as the particular effectiveness of the Varimax rotation method (Kaiser 1958). Once extraction and rotation have been carried out, it is important to select which factors, i.e. variables, are to be used in the indicator. This has been done taking simultaneously into consideration three selection criteria:

1. Kaiser criterion: is necessary to retain all factors extracted which have an eigenvalue superior than one (Kaiser, 1960).
2. Explained variance criterion: the basis for the selection is the cumulative explained variance. A level of explained variance of 70% is considered significant (Stevens, 2002).
3. Scree test: this method aims to give a graphical representation of the factors to be taken into consideration. The graph shows the value of the eigenvalue on the vertical axis and the number of eigenvalues on the horizontal axis. The eigenvalues are plotted as points connected by a single line. According to the Cattell method, the choice of factors should be limited to the point where there is a levelling in the slope of the line (Cattell, 1966).
Although it is desirable to assign different weights to the various factors considered, no reliable basis for doing this exists (Myer & Jencks, 1989, Testi and Ivaldi 2009). However, this does not mean no weighting, because equal weighting makes an implicit assumption on the weights being equal (Nardo, Saisana, Tarantola, Hoffman, & Giovannini, 2005). Once having selected the variables it is possible to aggregate them with the aim of getting an index which singles out Country Risk Index (CRI).

The selected methods is Mazziotta Pareto Index (MPI) (De Muro et al. 2007, Mazziotta and Pareto, 2012) is a non-compensatory index. The use of a non-compensatory index is important since Munda and Nardo (2005) affirm that “if one wants the weights to be interpreted as “importance coefficients” (or equivalently symmetrical importance of variables) non-compensatory aggregation procedures must be used”. MPI assumes the “non-substitutability” of the dimensions: equal importance is attributed to the dimensions and no compensation between them is allowed.

The MPI has been applied in the last decade to discuss the Millennium Development Goals (MDG) (De Muro et al. 2007), to identify social inequality in Italian regions (Mazziotta et al. 2010a, 2010b), to measure the Italian health infrastructure endowment (Mazziotta and Pareto 2011), to assess the quality of life in the Italian provinces (Mazziotta and Pareto 2012) and to measure political utilization in Italian regions (Ivaldi et al., 2016b). Therefore, we aggregated the four indicators following the MPI method that require the standardization of the individual indicators and the aggregation of the standardized indicators by arithmetic algorithm with penalty function based on horizontal variability, measured by the coefficient of variation, ensures that the score of the units which have a higher imbalance between the values of the indicators are penalized. Finally, by using the standardized deviation to calculate the synthetic index it is possible to obtain a measure which is robust and not very sensitive to the removal of a single elementary indicator (Mazziotta et al. 2012). The normalization process is carried out as follows:

$$z_{i,j} = 100 + \frac{(x_{i,j} - \mu_j)}{\sigma_j} \times 10$$

where $z_{i,j}$ is the standardized value of each j-th indicator of each i-th Country. $x_{i,j}$ is the original value of each j-th variable of each Country. $\mu_j$ is the mean of each j-th indicator. $\sigma_j$ is the standard deviation of each j-th indicator.

For each Country is calculated the average z-scores sum, the relative standard deviation and the Coefficient of variation (CV)

$$\mu_{z_i} = \frac{\sum_{j=1}^{4} z_{i,j}}{4}, \quad \sigma_{z_i} = \sqrt{\frac{\sum_{j=1}^{4} (z_{i,j} - \mu_{z_i})^2}{4}} \quad \text{CV}_{z_i} = \frac{\sigma_{z_i}}{\mu_{z_i}}$$

Then the index is calculated as:

$$MPI_i = \mu_{z_i} - \sigma_{z_i} \text{CV}_{z_i}$$

where $MPI_i$ is the value of the index for each country.

This approach is characterized by the use of a function that attributes a penalty to the units with unbalanced values of the partial composite indices. The penalty is based on the CV and is zero if all values are equal. The aim is to give an advantage to areas that, mean being equal, have a greater balance among the different dimensions of deprivation (Mazziotta and Pareto 2012).
Therefore, MPI is constructed with the aggregation of the indicators of each dimension and with the sum of the partial composite indices. To complete the analysis, it’s useful to divide countries in classes in order to make the comparison between the two indices easier. In this paper authors apply a cluster analysis since it can be applied to group the information on countries (Nardo, Saisana, Tarantola, Hoffman, & Giovannini, 2005).

As Berkhin (2006) points out: “clustering is a division of data into groups of similar objects; they are similar between themselves, but are dissimilar to the elements of other groups. Each group, called cluster, consists of objects that are similar between themselves and dissimilar to objects of other groups.” Traditionally clustering techniques are broadly divided in hierarchical and partitioning and in this case it’s better to apply the first since this dataset is quite small, otherwise this technique would be very sub-optimal. Hierarchical clustering builds a cluster hierarchy, that is, a tree of clusters, also known as a dendrogram. There are two categories of hierarchical clustering methods: agglomerative (bottom-up) and divisive (top-down). If subsets of points are to be merged or split rather than individual points, one needs to generalise the distance between individual points to the distance between subsets. Such derived proximity measure is called a linkage metric. Hierarchical algorithms are significantly affected by the type of linkage metric used, since the latter reflects a particular concept of closeness and connectivity (Berkhin, 2006).

The prominent inter-cluster linkage metrics are single link, average link, and complete link. The underlying dissimilarity measure (which is usually distance) is calculated for every pair of points with one point in the first set and another point in the second set. A specific operation such as minimum (single link), average (average link), or maximum (complete link) is applied to pair-wise dissimilarity measures:

\[ d(C_1, C_2) = \text{operation}\{d(x,y)|x \in C_1, y \in C_2\} \]

The methods that employ inter-cluster distances defined in terms of pairs with points in two respective clusters (subsets) go by the name “graph methods”. These methods can be joined by so-called geometric methods, in which a cluster is represented by its central point. The results can be centroid, median, and minimum variance linkage metrics.

In this work it’s possible to use Ward’s method, according to which the distance between two clusters, 1 and 2, is given by the increase of the sum of squares obtained when we merge them. With hierarchical clustering, the sum of squares starts out at zero and then increases as clusters are merged. In the method of Ward it’s keep to limit this growth as much as possible. (Ward, 1963).

RESULTS

Beginning from the variables listed in Table 2, we use principal component analysis to evaluate which variables should be left, following the three criteria already highlighted above: Kaiser’s method, scree test and explained variance criterion.

Table 2. Rotated Component Matrix(a)
Table 3. Total Variance Explained

<table>
<thead>
<tr>
<th>Component</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>1</td>
<td>2.930</td>
</tr>
<tr>
<td>2</td>
<td>2.014</td>
</tr>
<tr>
<td>3</td>
<td>1.943</td>
</tr>
<tr>
<td>4</td>
<td>1.906</td>
</tr>
<tr>
<td>5</td>
<td>1.488</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Figure 1 shows scree plot and Table 3 shows values of explained variance. Since the second component explains just 62% of the variance we take into account all the three components and do not exclude any variable, as suggested also by the other two methods.

Following what is shown in the method, the index has been calculated with MPI. The final step consists in grouping the values of indexes into categories to identify the areas with similar socio-economic conditions. Applying cluster analysis to CRI we obtain six classes in which we can group the Countries and Table 4 and Figure 2 show the resulted dendrograms from this analysis.

**Table 4. Country Risk Index (CRI)**

<table>
<thead>
<tr>
<th>n</th>
<th>Country</th>
<th>MPI (CRI)</th>
<th>class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Switzerland</td>
<td>107.53</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Luxembourg</td>
<td>106.75</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Iceland</td>
<td>105.11</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Norway</td>
<td>104.39</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Czech Republic</td>
<td>103.49</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Sweden</td>
<td>103.17</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Estonia</td>
<td>101.68</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Denmark</td>
<td>101.32</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Korea. Rep.</td>
<td>101.02</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Slovak Republic</td>
<td>100.93</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>Germany</td>
<td>100.63</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>Ireland</td>
<td>100.55</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>Austria</td>
<td>100.50</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>New Zealand</td>
<td>100.50</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>Canada</td>
<td>100.37</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>Hungary</td>
<td>99.50</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>Australia</td>
<td>99.16</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>Belgium</td>
<td>98.92</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>United Kingdom</td>
<td>98.40</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Country</td>
<td>Value</td>
<td>Rank</td>
</tr>
<tr>
<td>---</td>
<td>-----------------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>20</td>
<td>Slovenia</td>
<td>98.28</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>Netherlands</td>
<td>98.10</td>
<td>4</td>
</tr>
<tr>
<td>22</td>
<td>Latvia</td>
<td>97.45</td>
<td>4</td>
</tr>
<tr>
<td>23</td>
<td>Finland</td>
<td>97.42</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td>United States</td>
<td>97.23</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>Israel</td>
<td>97.04</td>
<td>4</td>
</tr>
<tr>
<td>26</td>
<td>Mexico</td>
<td>96.93</td>
<td>4</td>
</tr>
<tr>
<td>27</td>
<td>Chile</td>
<td>96.43</td>
<td>5</td>
</tr>
<tr>
<td>28</td>
<td>Portugal</td>
<td>96.05</td>
<td>5</td>
</tr>
<tr>
<td>29</td>
<td>Turkey</td>
<td>95.63</td>
<td>5</td>
</tr>
<tr>
<td>30</td>
<td>France</td>
<td>95.56</td>
<td>5</td>
</tr>
<tr>
<td>31</td>
<td>Poland</td>
<td>95.53</td>
<td>5</td>
</tr>
<tr>
<td>32</td>
<td>Japan</td>
<td>95.23</td>
<td>5</td>
</tr>
<tr>
<td>33</td>
<td>Spain</td>
<td>95.21</td>
<td>5</td>
</tr>
<tr>
<td>34</td>
<td>Italy</td>
<td>93.61</td>
<td>5</td>
</tr>
<tr>
<td>35</td>
<td>Greece</td>
<td>90.27</td>
<td>6</td>
</tr>
</tbody>
</table>

*Figure 2. Hierarchical cluster analysis – Dendrogram using Ward methods*
The scores have been reckoned and the rankings set up. The index places a 107.50 for Switzerland, which shows the lowest CR and at 90.28 from the Greece, which shows the highest CR.

Even though the rankings at the top and down are surely not unexpected, looking at the entire classification we can see results that apparently contrast historical tendencies or the rating based on a single criterion.

Switzerland and Luxembourg are in the first class. The two small countries are historically characterized by efficient markets and stable economies, high standards of living and widespread good socioeconomic conditions.
Switzerland has high standard of living, industrial productivity and quality of education and health care systems and its GDP per capita is among the highest in Europe. Luxembourg’s economy is characterized by the catching taxation system and the high level of international openness. The financial sector is the main driving resource. It supports the Grand Duchy’s economy, representing about 36% of the country’s GDP, but also industry and export are important components.

The following class includes countries not very affected by the financial crisis. Iceland can exploit renewable energy sources and exports fishery products, so its economic outlook is positive: this country has a small budget surplus, public debt is falling (although remains above its pre-crisis levels) and, in 2015, was able to pay back the loan that was granted by the International Monetary Fund in 2008.

Another emergent country is Czech Republic, whose economy, based almost exclusively on automobile industry and tourism, is one of the most developed in Central and Eastern Europe. The country presents a very dynamic economy, with low rate of unemployment and growing wages; from 2015 its economy grows, thanks principally to domestic consumption and public investment. In the second class there are also Norway and Sweden, a couple of highly developed post-industrial societies: both of them have very high GDP per capita, and among the highest level of taxation in the world, coupled with outstanding welfare state. However, Norwegian economy is dependent on the revenue generated by the North Sea oil, and Sweden is sensitive to external shocks due to its dependence on export. Therefore, both of them contracted during the global financial crisis, which hit heavily also the Eurozone.

In the third class we have emerging countries and well-established economic powers. The European countries defined Ex Transition Countries (Slovak Republic and Estonia), became dynamic market economy in the 2000s. Emerging countries South Korea and Ireland participate well to the international trade with their specific production: high-tech goods and integrated circuits respectively. Furthermore, in recent years Slovak Republic and Ireland implemented a light taxation system that gave them important competitive advantages.

Rich countries like Germany, Austria, Canada suffered the global economic crisis and the shrinking European demand, which affected their economy performance. In particular, Germany, whose external trade is about 84% of the GDP, exports cars, car components, drugs, and this gets it highly sensitive to the external shocks, namely the fall of European demand.

Now Austria, after a period of stagnation, has a recovery in terms of GDP growth, but its rate of unemployment increases, offering an impressive, extreme example of jobless recovery. Danish economy is very open and financialized; but, in spite of its high GDP per capita and almost negligible social inequality, it suffers from low productivity.

Out of Europe, New Zealand’s economy is based on tourism and agriculture. It has been damaged by the milk price decline on the international market, since New Zealand is the world’s largest exporter of milk. It has restarted growing only in 2016. Canada, leader in the export of zinc, uranium, and other commodities, with a foreign trade representing about the 65% of the GDP, suffers the consequences of the low oil price.

In the fourth class, there is strong heterogeneity. We can find both countries heavily affected by the global financial crisis, and countries that in the last years have been able to invest their resources to gain higher level of competitiveness. The United Kingdom was hit by the crisis particularly in its financial market, but now it is recovering, even if remains the high public deficit and the significant rate of young unemployment remain, together with the aftermath of the Brexit, which are partly unpredictable today. The Netherlands have a very open economy, are the sixth largest economic power in the Eurozone and the fifth largest exporter of goods; but its strength transformed in weakness, because the Eurozone slump, as we have seen, contracted the demand for export. Finland is one of the leading countries in the new
technologies, but it is also the country in the Eurozone much hit by the crisis. It suffers from increasing unemployment and inequality, despite its high living standard.
The big economy of the United States is growing, thanks to the fiscal and monetary stimulus package. On the other hand, the ratio public debt/GDP is growing as well, industrial exports slump and inequality is deepening.

Hungary, Slovenia, Latvia (ex-Transition Country) and Mexico, are developing countries, with open economies, characterized by deep inequality and widespread poverty. Hungary is the host country to several R&D division or headquarters of international companies, thanks to its light fiscal policy; furthermore, an effective policy against unemployment has been realized, therefore the rate of unemployment falls. Slovenia completed its economic transition successfully, following and consolidating its long tradition of economic integration with neighboring countries, particularly Germany, Austria and Italy, and drawing benefit from a skilled and productive labor force; therefore, it has a comparatively low unemployment rate. Due to its strategical geographic position, in Latvian economy logistics, especially transport of oil and raw materials between CIS and Europe, is the most important sector. Mexico has an export-oriented economy, strictly dependent on the USA economic cycle, and it is also an emerging financial market. Its per capita income is the highest in Latin America, but its deep inequality is witnessed by the amazing percentage of people living behind the line of poverty (45%).

In Australian economy, international trade is about the 41% of GDP (2015), mainly with China. The country has raw materials, parks and natural reserves, and its economic structure is based on export of commodities, tourism and services. Australia is the only OECD country that did not fall in recession during the financial crisis.

Belgium, after 2013, have had a slow recovery, thanks to its policies, but it suffers for high young unemployment.

Israel’s financial market becomes more and more important, and it has a high level of investment in research and development. In recent years the unemployment rate has declined dramatically, but the social and economic integration of Arab and Haredi (ultra-Orthodox Jewish) minorities remains the great challenge to face.

The fifth group includes European country ravaged by the financial crisis, with unemployment and economic uncertainty; and developing countries that are building their economic structures.

In Portugal there are decline in investment, particularly in construction, and slowdown in private consumption and export. However, there are feeble signals of recovery in the medium-long run, e.g. the small decrease of the rate of unemployment. France is one of the most important world export powers and has accused the decline of the foreign demand. Its unemployment has increased very much, as well as its public debt. Spanish economy, based on tourism and financial services, after six years of recession has recovered from 2016 when, supported by domestic demand, the economy has begun to grow, also reducing the level of unemployment. It is the European country where the state integrity is most at risk.

Italy’s points of weakness are public debt, young unemployment, stagnation and political instability. Another long-lasting question is territorial inequality, between the quite modern North, and the backward South, where the organized crime is a secular plague. Poland is the only EU country that has maintained positive growth throughout the global economic crisis, and saw a significant growth that made it an important player in the European market. But it is still characterized by high inequality and unemployment, and territorial unbalances.
Chile, one of South America's most prosperous nations, must fight now against the widespread socioeconomic inequalities. The recent policy of investment in renewable energy should guarantee energy sufficient to cover the 20% of requirements in coming years. Turkey suffers the political instability and the low level of household consumption, due also to inequality. A significant contribute to the national income comes from construction and from the public investment in infrastructure projects. Despite these positive points, the high level of unemployment, very low wages and large informal sector are persistent difficulties in Turkey. Japan has a strong dependence on import of petroleum and raw material and on export of manufactures, then it is exposed to external shocks. Further concerns that Japan will have to address in the near future are the aging of the population and the political tensions with South Korea and China.

In the last class, Greece has a very precarious economy, that has been experiencing many years of recession, increasing levels of unemployment and also environmental crisis (a problem which receive less attention). The Greek crisis, since 2010, when the country neared bankruptcy, engendered the rise of the debt with Europe and IMF, which created political and economic tensions and the concrete risk of Grexit from UE.

CONCLUSIONS

Nowadays most large corporations make it a priority to understand, analyse and incorporate country risk, as their success in a global market is increasingly dependent upon growth in foreign markets.

Country-level risks, which are often complex, integrated, and fast changing, together with their cumulative impacts represent vexing challenges or issues for businesses, governmental bodies, NGOs, and other types of organizations, as well as for researchers and students. Strategic thinkers who have specific goals and queries, need interactive, dynamic, well-conceptualized, and holistic tools in order to identify, assess, probe, and respond to country-level challenges (Brown et al 2015).

However, it is possible to question the accuracy of any risk rating agency in determining any or all of these measures. Our proposed index can help to find out earlier, on the basis of a limited number of variables, the existence of potential risks for the operators. Operators will thus be allowed to formulate a better quantitative and qualitative estimate of the ongoing events over a short period. With regard to this, there is no doubt that prompt insight can play a role of great importance, especially with regard to the events currently taking place and evolving. Therefore, advance insight represents added value, which moreover needs further analysis to compare and complete with the opinions emerging from the procedure “consensus-building” put in place by experts from the top agencies and evaluators of the risk assessment institutions. In general, it is appropriate to consider that, besides the emerging risks from trading exchange, which can be partially covered by insurance, there are others scarcely safeguarded, or even without any protection at all. They are, e. g., the risks dependent on geopolitical events, or deriving from insolvency at the level of sovereign debt, from constraints and restrictions such as the financial and currency hindrances, from excessive variations of price, interest rate, and foreign exchange up-and-down.

Our indicator classifies the Ocse countries into six main groups, according to their high or low country risk. Looking at the entire classification, we have results partly foregone, but partly in contrast with historical tendencies or the rating based on a single criterion.

In the first class we have a couple of countries with high standards of living and efficient and stable markets. The second class includes countries scarcely affected by the financial crisis.
Iceland, which exploits renewable energy sources and exports fishery products, has a positive economic outlook. The growth of Czech Republic, based on automotive industry and tourism, is largely due to domestic consumption and public investment. Norway and Sweden are post-industrial countries, with high GDP per capita, heavy taxation and, perhaps, the best welfare state in Ocse countries. Nevertheless, both of them contracted during the global crisis.

In the third class there are emerging countries (Slovak Republic and Estonia, a couple of Ex Transition Countries, and South Korea and Ireland) and solid rich states, like Germany, Austria, Denmark, and, out of Europe, New Zealand and Canada, which have been affected by the crisis and have reduced their export. Also the fourth group is heterogeneous. There are the United Kingdom, hit by the financial crisis, and the Netherlands, which have a very open economy, suffering from the drop of export. Finland is leader in the new technologies, but has been greatly damaged by the crisis. Also the CR of the US is quite high, perhaps unexpectedly. This is due to their growing public debt/GDP ratio, the slump of export and the growing inequality. Widespread poverty and deep inequality characterise also a group of countries, partly Ex Transition countries: Hungary, Slovenia, Latvia and Mexico. High young unemployment and political risk. Belgium and Israel, respectively; also them are part of the fourth class, together with Australia.

In the fifth class there are big countries of the UE (France, Spain, Italy), together with Poland and Portugal, and, out of Europe, Chile, Turkey and Japan. Political instability, crime, social and territorial inequality, public debt, unemployment, slump in household consumption affect more or less all of them. Japan due its poor score to the openness of its economy, which expose it to external shocks. Furthermore, the average age of population is high, and it is developing political tension with China and South Korea. Finally, Greece is at the last level. It has been experiencing recession and unemployment and also environmental crisis (a problem which receive less attention). In 2010, when the country neared bankruptcy, the debt with Europe and IMF soared, triggering internal political tension and the concrete risk of Grexit from UE.

We can conclude observing that the process of measuring the Country Risk is a continuous work in progress. The proposed index sheds light particularly on the risk linked to political-economical events and decisions, and on the public finance. Our CR Index allows to asses international country risk ratings comparatively, and to single out the relevance of economic, financial and political risk as components of a general risk rating.

As the global economic and financial environment changes, it becomes imperative to look at new variables, and assessing CR is key. On the other hand, thanks to the advent of digital storage facilities and as data collection improves, researchers have access to enormous amount of data. Therefore, together with enhanced computing capacity, we can apply better techniques to more extensive models of CR appraisal.
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