GLOBALISATION, GLOBAL CHALLENGES AND GLOBAL CHAOS. THE NEED OF A NEW APPROACH

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Abstract

The research in the paper is based on the idea that the present crisis is very complex and unique. In order to quantify the defence capacity of different regional economic entities against the crisis' impact, a new mathematical model is proposed. It covers some representative indicators which have high impact on present human society. The model was implemented on four important regional economic entities and pointed out the disparities in fighting against the present crisis. The model can be used as an operative instrument for the supra/national/regional decision makers. It can be easily extended to more indicators and more regional economic entities.

Keywords: complex crisis; defence capacity indicator; defence maximization function; regional complex disparities.

1. General approach

The new millennium is characterised by alternative global and macro-regional crises. The global economic crisis started in 2007 had a powerful impact on the world economy, including the most developed countries.

On the other hand, the global pollution and the continuous deterioration of the environment conditions led to new controversies between the greatest global economic actors. As a result, USA withdrawal from the Paris Agreement on climate change mitigation (Barnini, C., 2017).

Third, the refugees' crisis represent a vulnerable aspect of the present development. It puts under discussion the EU's unity and even the future of this regional organisation. At the beginning of 2020, almost 4 million refugees were camped in Turkey. The Turkish President used them to push EU to give more money to this country. In this context, Greece becomes the shield of the EU against these refugees' "invasion" (Lane, A., 2019).

Forth, the regional military conflicts can easily transform in real wars. The recent warlike statements between Turkey and Russia are just an example (REUTERS,

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2020).

But 2020 brought a new type of global crisis generated by COVID-19. This crisis is a new form because it has impact on economy, social life wealth, regional organisations, etc. and imposes a new paradigm on the globalisation (see Figure 1).,
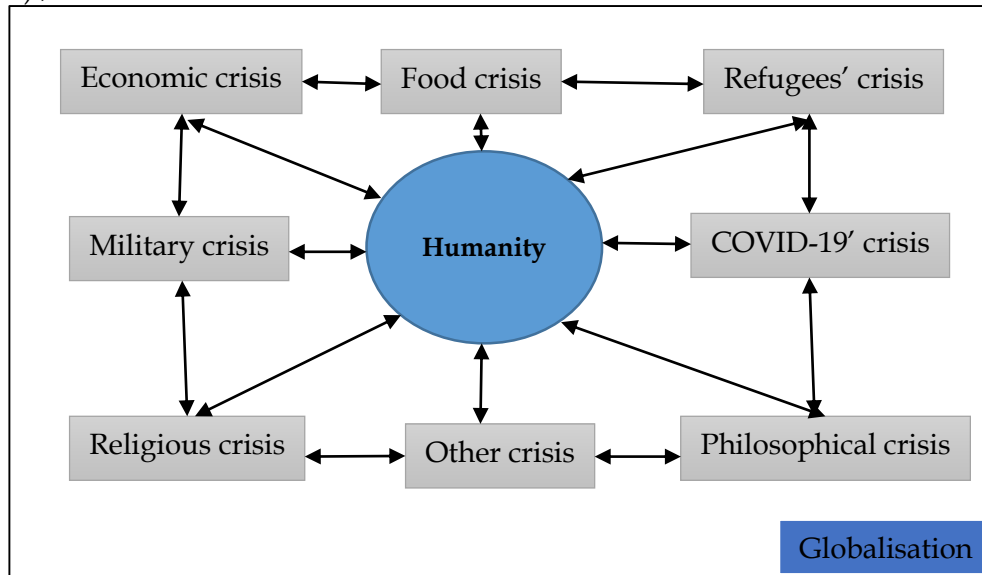

Figure 1: Globalisation under the new complex challenge
Source: author's contribution

According to Figure 1, the present crisis is summing up all "classical "crises that humanity has faced so far. More, the globalisation which achieved high dimensions seems to become the ideal support for the transmission of the present complex crisis.

The present paper offers an answer to the question regarding the globalisation role in generalization of the crisis and the need of a new approach in solving this crisis by moving the greatest part of the anti-crisis measures from supranational to national decision makers.

2. Literature review

It is very difficult to realise a literature review related to a phenomenon which is in full swing. This literature review is focused on crises and globalisation.

Two years ago, some specialists quantified and predicted three financial crises: the financial crisis from Asia (1997-1998), the global financial crisis which started in 2008 and the debt crisis from Euro area from 2010 (Buckley, R. P., Avgouleas, E. and Arner, D.W., 2018). They pointed out that the frequency of the next financial crises will increase. The main elements that support this process are the collapse of the Bretton Woods' international monetary system, globalisation and financial internationalization. Moreover, these specialists pointed out that globalisation would have negative impact on national and regional economic organisations.

Other pessimistic approach puts into account the existence of a Global Crisis Management. The authors of this research considered that the traditional three-stage approach describing crisis management is not enough today. The pre-crisis phase (prevention and preparation), the crisis phase (response), and the post-crisis phase (learning and revision) as they are described by the classic management are not able to support the finding of the solutions for the new global challenges (Coombsa, W.T. & Lauferb, D., 2018).

An interesting analysis covers more than 70 years and is based on the dynamics of the global economy and is focused on building a new sustainable model of the global development. The analysis is performed on structural levels: the level of current international regimes, the level of central models of development and crisis, and the level of the dominant types of business innovation (Vlados, C., 2019). The problem is that the proposed model was not able to predict the actual complex crisis.

A distinct approach is that which covered 11 articles summarized in a common publication regarding the lines of inquiry and findings the origins of the global financial crisis" (Siege, L.B. & Garcia-Feijóo, L., 2019). An interesting idea of this research is that of growing opposition to globalization in the wake of the crisis, decreasing the cross-border investing and international trade. On the other hand, the most important world decision makers are not ready to more effectively respond to financial crises.

In 2019, a distinct research pointed out the importance of the health research in humanitarian crises. These crises "have immense acute and long-term health impacts on hundreds of millions of people." The difficulties in developing a global performant medical healthcare system and the society's more interest in economic investment than in medical investments led to a global deficit in protecting population during the health crises (Kohrt, B.A., Anand, N., Beecroft, B. and Nuwayhid, I., 2019).

Finally, other research starts from the idea that the financial crises are accompanied by permanent drops in economic growth, output and

technological progress. The negative impact is higher for those industries that are more dependent on external finance. The lack of banks' financing the investment in R&D during the crises results in less patenting "for 10 years or longer after a banking crisis"(Hardy, B. & Sever, C., 2020).

The present paper proposes a new approach regarding the complex challenges whose humanity has to face.

The objective of the research are:

O1: Identifying the elements which are essential in improving the national/regional defence capacity during the present crisis.

O2: Quantifying each element of influence and building an adequate database.

O3: Realising a hierarchy of the most important regional actors according to their defence capacity.

3. Methods and methodology

The present analysis takes into consideration six important indicators which have maximum impact in the national defence capacity against the complex crisis in 2020 and afterwards: GDP (PPP)/capita, foreign-exchange reserves, hospital beds/1000 inhabitants, R&D spending, gold reserves and current-account balance. The whole approach is based on the following hypotheses:

H1: Some from above indicators (GDP (PPP)/capita, foreign-exchange reserves/1000 inhabitants, hospital beds/1000 inhabitants, R&D spending as % of GDP, gold reserves/1000 inhabitants and current-account balance/1000 inhabitants have to be as large as possible.

H2: The current-account balance as % of GDP has to be positive too, because it quantifies the dependence of the economic entities by the imports.

H3: In order to simplify the analysis, it is assumed that all above six indicators have the same contribution to the national/regional defence capacity against the present complex crisis.

The statistical data resulted from the built databased were presented in Table 1. GDP/capita is calculated in USD for 2019 (Statistics Times.com, 2019). The foreign-exchange reserves/1000 inhabitants quantify the regional entity's capacity to pay possible more and expensive imports under the complex crisis impact (CEIC, 2020). The hospital beds/1000 inhabitants are very important under present conditions. The problem is that each hospital bed has different amenities from a country to another (Eurostat, 2019). The R&D spending as % of GDP is important because it can support the adapting the regional economies to the accidental changes and beyond (World Bank, 2019). The gold reserves/1000 inhabitants are important because they can increase the purchasing power of each regional economy in its relationships to the trade

partners (World Gold Council, 2020). Finally, the current-account balance/1000 inhabitants points out the result of the international trade for each regional entity. A positive great result of this balance express the possibility to export efficiently in order to buy more from import (European Commission, 2019).

Table 1: Statistical database

Regio-nal entity	GDP/capita (USD)	Foreign exchange reserves (mill. USD/1000 inhabitants)	Hospital beds/1000 inhabitants (number)	R&D spending as % of GDP	Gold reserves/ 1000 inhabitants (tonnes)	Current-account balance/ 1000 inhabi-tants (mill. USD)
USA	65112	0.39	2.77	2.74	0.025	-1.462
Japan	45546	11.1	13.05	3.15	0.006	1.256
China	19504	2.16	4.34	2.19	0.001	0.062
EU	44539	0.66	3.72	1.64	0.024	0.400

Source: author contribution

According to the above presentation, the propose model is basically a maximization function as:

$$Y = [max]\sum_{i=1}^{4}(gdp_i * a_i + fer_i * b_i + hb_i * c_i + r\&d_i * d_i + gr_i * e_i + cab_i * f_i) + \varepsilon \tag{1}$$

$$\text{If: } cab_i > 0 \tag{2}$$

and $\varepsilon \neq 0$. (3)

In the above equation: gdp - GDP/capita; fer - Foreign exchange reserves/ 1000 inhabitants; hb - Hospital beds/1000 inhabitants; r&d - R&D spending as % of GDP; gr - Gold reserves/1000 inhabitants; cab - Current-account balance/1000 inhabitants; i – all four regional entities; ε - correction element; a, b, c, d, e, f - coefficients that express the weight of each indicator in achieving the ability to defend the crisis. According to H3:

$$a = b = c = d = e = f \tag{4}$$

4. Results and discussion

Applying the proposed model to the statistical data from Table 1 leads to interesting observations regarding the low capacity of the most important regional actors to face the present crisis' challenges.
It is no doubt that the highest economic development is in USA, which have the possibility to fight better against the present complex crisis (see Figure 2).
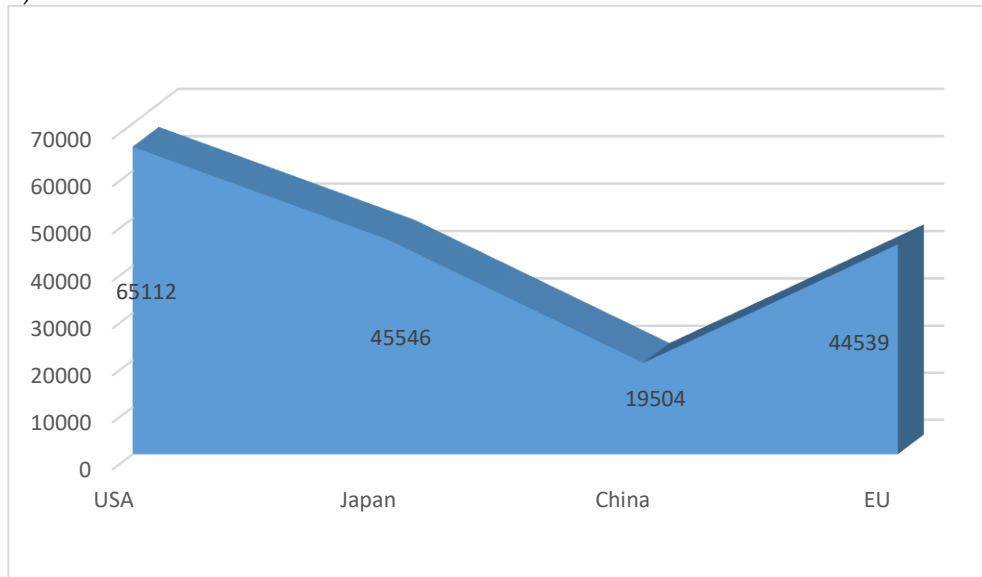

Figure 2: Regional disparities related to GDP/capita (USD)
Source: author's contribution

The bottom of this indicator is achieved in China and it is potentiated by the lowest inhabitants' welfare across the main regional economic actors. EU presents almost the same value of the indicator as in Japan.
There is a huge difference between the total foreign exchange reserves and the foreign exchange reserves/1000 inhabitants. China has the greatest total foreign exchange reserves, but not the greatest foreign exchange reserves/1000 inhabitants (see Figure 3). Japan achieved the greatest reserves/1000 inhabitants. There are 16.8 times greater than in EU and 28.5 times greater than in USA. USA present a sensibility regarding this indicator, while China, with a huge population, has better position.
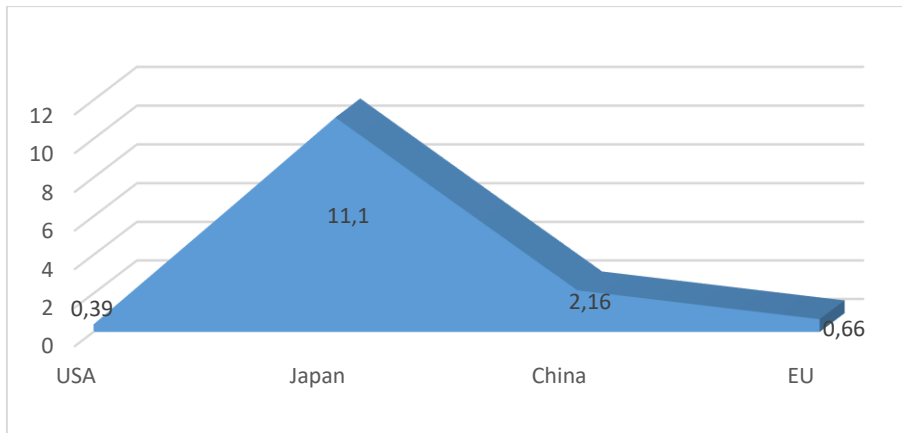
Figure 3: Regional disparities related to foreign exchange reserves (mill.
USD/1000 inhabitants)
Source: author's contribution

Other sensible indicator is hospital beds/1000 inhabitants. For the beginning, it is necessary to point out that the hospital equipment differ a lot to a country to another. From the statistical point of view, the best situation is in Japan, which have 3 times more hospital beds/1000 inhabitants than China, which is ranked on the 2nd position (see Figure 4). According to Figure 4, USA achieved the worst rank for the second time.
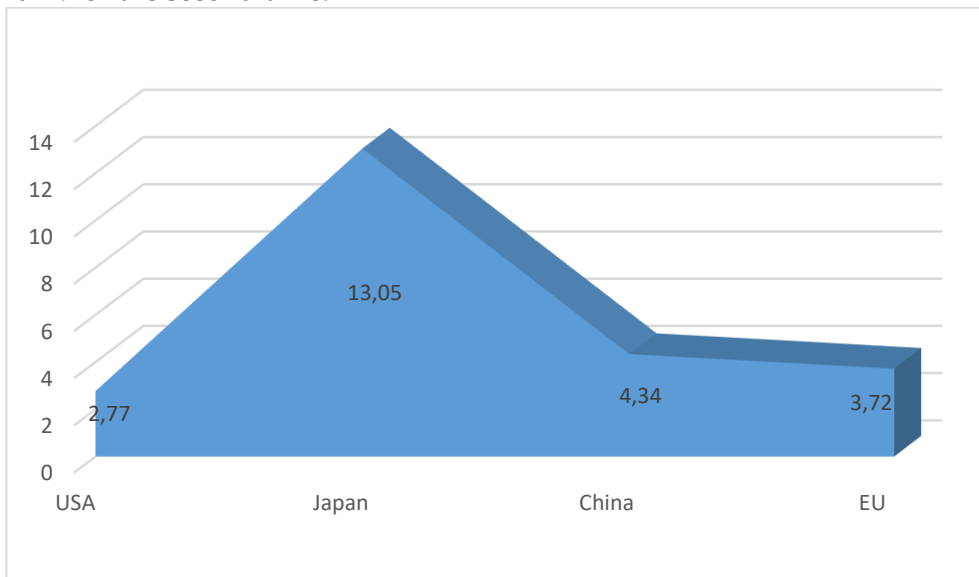
Figure 4: Regional disparities related to hospital beds (beds number/1000

inhabitants)
Source: author's contribution

The R&D spending as % of GDP quantifies the ability of each regional economy to respond to the crisis' challenges. It is for the first time when EU faces to the worst situation (see Figure 5). The top value is achieved in Japan.
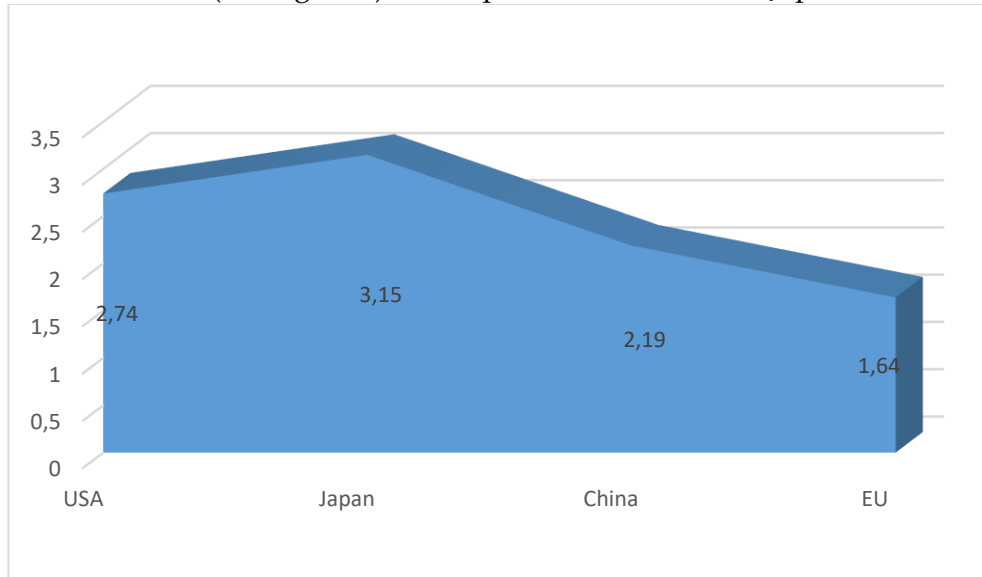

Figure 5: Regional disparities related to R&D spending (% of GDP)
Source: author's contribution

The gold reserves/1000 inhabitants were taken into consideration because they can increase the payment capacity of the regional economies in order to cover more essential imports during the present complex crisis. The peak values of this indicator are achieved by USA and EU. The lag between these two regional economies and Japan and China regarding the indicator are huge (see Figure 6).
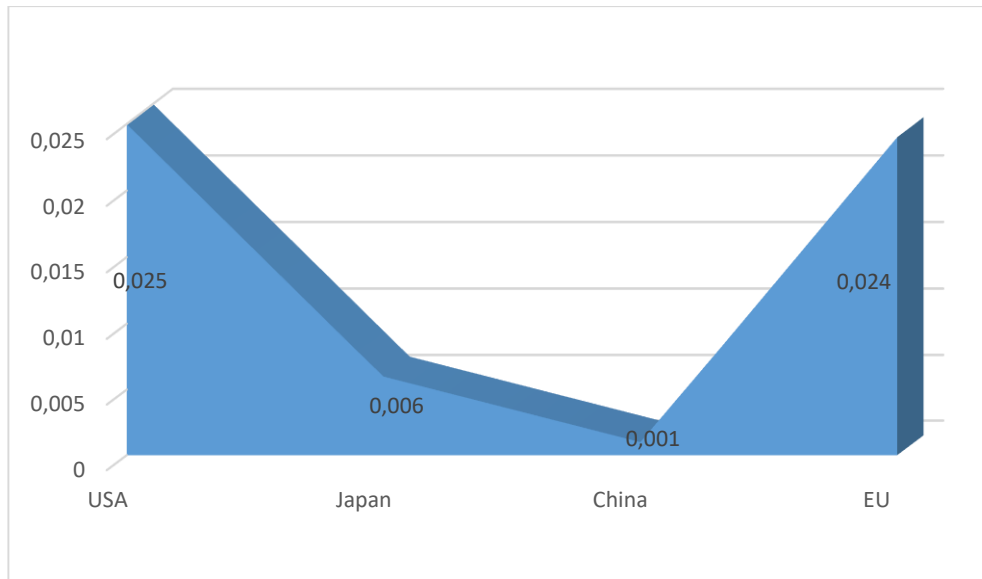
Figure 6: Regional disparities related to gold reserves/1000 inhabitants
(tonnes)
Source: author's contribution

Finally, the current-account balance/1000 inhabitants is an indicator which potentiates the effect of the international trade on each analysed regional economy. It is well-known that USA faces to a chronic trade deficit. The other three analysed regional economies have current-account surplus. The greatest one belongs to Japan and is supported by the Japanese government's policy of maintaining low exchange rates for the national currency. Moreover, it is for the third time when USA faces to the worst position among the analysed regional economies (see Table 7).
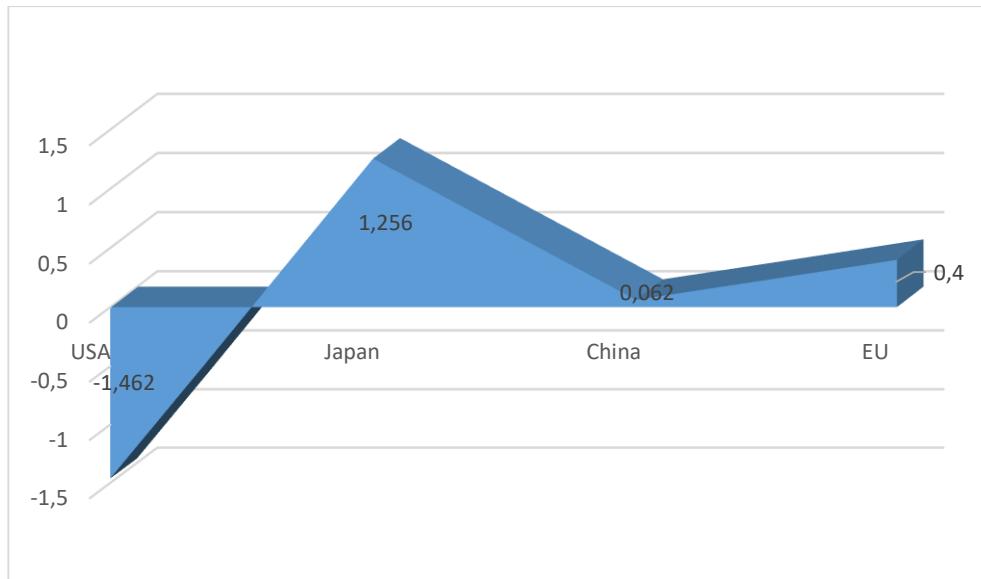
Figure 7: Regional disparities related to current-account balance/1000
inhabitants (mill. USD)
Source: author's contribution

The concomitant analysis of all above six indicators leads to the idea that they have to be quantified under the same assumptions. As a result, the GDP/capita has to be used in analysis as GDP/1000 inhabitants. The results of this approach in direct connection to the composite indicator of the defence capacity against the present complex crisis (Y) lead to the representation as in Figure 8, where gdpa represents GDP/1000 inhabitants.

5. Conclusion

The above analysis respected all 3 hypothesis. The highest values of the six indicators support the increasing of the regional economies defence capacity against the present complex crisis (H1).
The current-account surplus has positive impact of the defence capacity, while the negative result decreases the same capacity (H2).
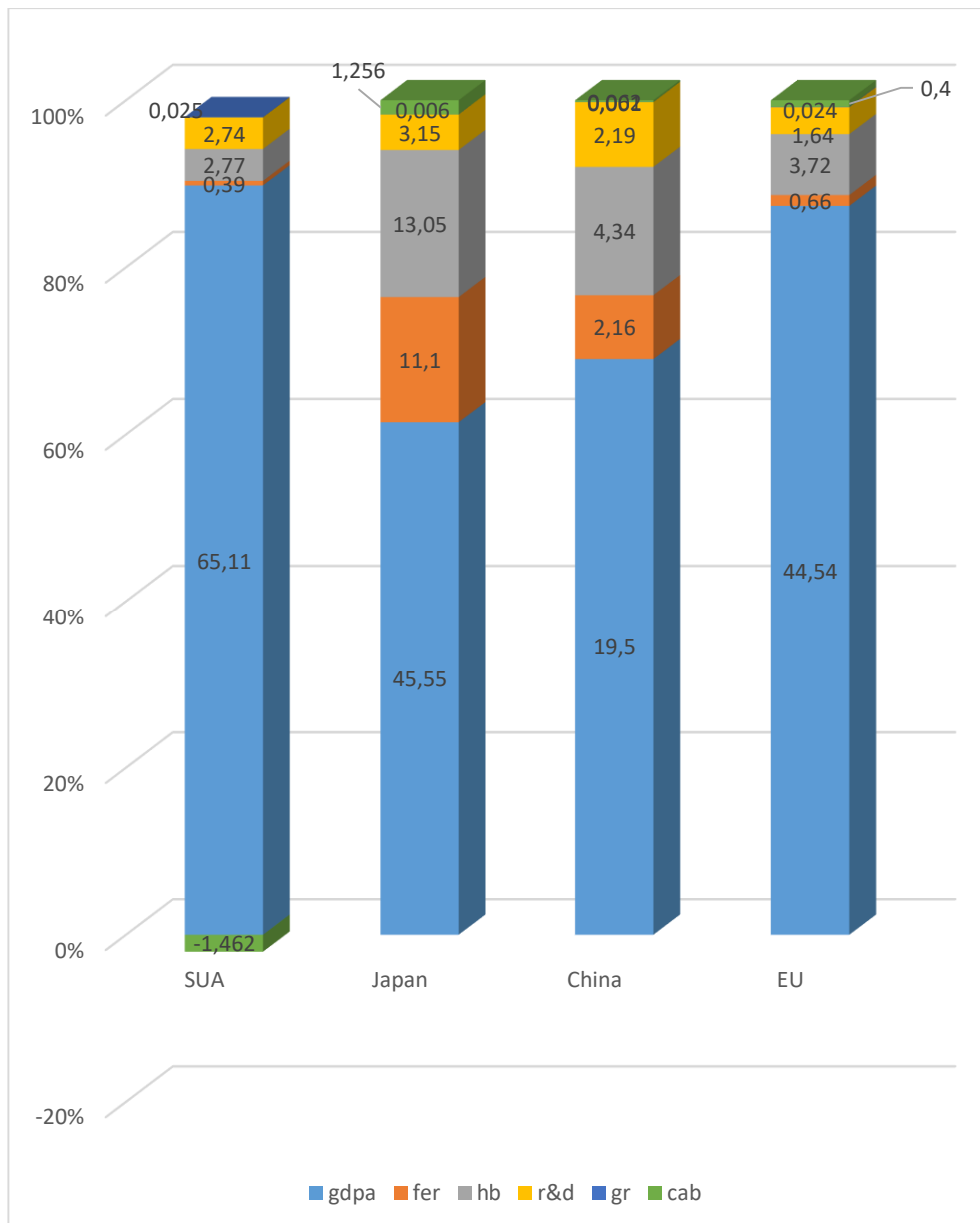The analysis takes into consideration the same share of each indicator to the final Y (H3).

Figure 8: Regional disparities related to the composite indicator Y
Source: author's contribution

As a result, Japan seems to be better prepared for fighting against present complex crisis (Y=12.35). It is followed by USA (Y= 11.59) and EU (Y= 8.49),

while China has real problems to resist to all challenges (Y= 4.71), (see Figure 9).
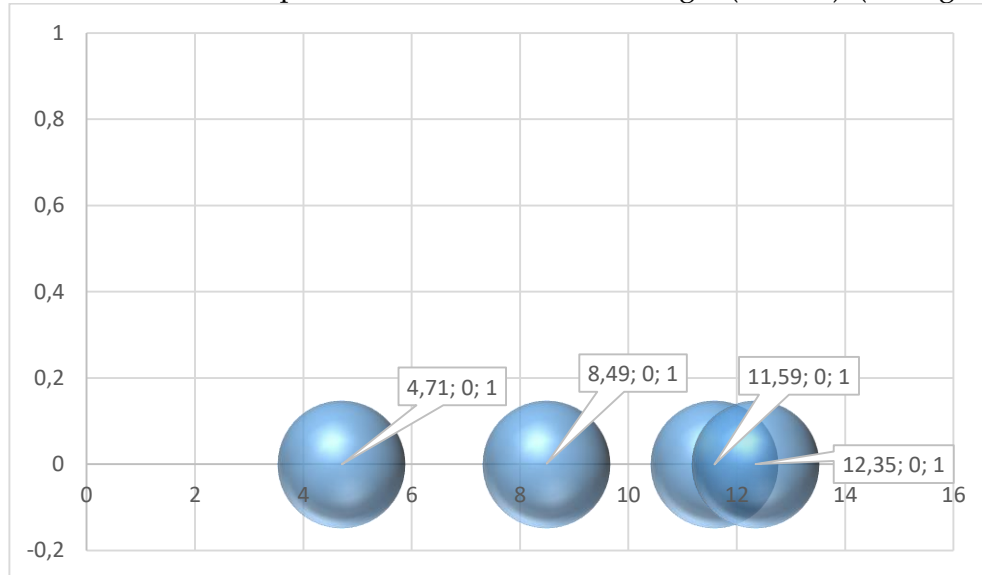

Figure 9: Regional adjusted disparities related to the composite indicator Y
Source: author's contribution

The paper succeeded in covering the initial objectives. It selected the most pertinent indicators which have the greatest impact during the present complex crisis (Objective O1).

Using the latest official statistical data, a pertinent database was built for the most representative regional economic actors: USA, Japan, China and EU (O2).

The proposed model in the paper allowed realising a ranking according to each regional entity's capacity to fight against the crisis (O3).

A limitation of the model are the non-use of other indicators, but it easy to understand that the proposed model can be extended as long as in necessary. The second limitation is that the all analysed indicators have the same weight in computing the final Y.

With all these limitations, the results of the proposed model are valid and it can be used as a good instrument for the regional/national/supranational decision makers in order to quantify the defence capacity of the region against the crisis' challenges.

Moreover, this model can be an excellent starting point in building a new approach in fighting against present and future complex crises.

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