

# ***ECONOMIC INTELLIGENCE INDEX AS MEASURE OF THE NATIONAL ECONOMIC INTELLIGENCE CAPABILITY***

**Starostina Alla**

Doctor of Ec. Science, Professor of Taras Shevchenko National University of Kyiv

**Adami C.**

M.Sc., Ph.D.candidate of Taras Shevchenko National University of Kyiv

**INTRODUCTION:**In the last decades, the expansion of the globalization phenomenon has started to revolutionize the world economy, making the different national economies more interconnected [3]. In that new complex environment, the risk for a country to lose its position of economic influence towards other national entities is increasing [7]. The Economic Intelligence (EI) is a new discipline introduced by scholars and practitioners, in order to develop and use information asymmetries [1, 2, 4, 5, 6]. A significant position of a country in the network of international economic relations constitutes a situation of potential advantages versus other states, and a measure of the national EI capability to face the threats associated to the new scenario.

The purpose of this thesis conference consists precisely in measuring the predisposition of the world's nations to implement an effective and efficient EI strategy, by quantifying the importance of their positions in the system of the global relations by means of an Economic Intelligence Index (EII), computed as weighted average of the main centrality indexes of the network [8].

The specific network of relations chosen for quantifying the importance of the position of the countries is represented by the flows of bilateral trade among the first fifty world exporters in the year 2018, and the factors taken into consideration for measuring the value of the stance of a national entity in the system is epitomized by the four centrality indexes: degree centrality, closeness centrality, betweenness centrality and eigenvector centrality. The first index refers to the number of nodes adjacent to each other. In the international trade networks that index measures the direct trade flows between each country with the rest of the world. The closeness centrality is instead based on the distance between the nodes and focuses attention on the proximity that exists between a country and all the others present within the network in question. It consists in the average of the distances of a node from the others. The betweenness centrality is another important measure of centrality, which allows to identify those countries that act as a bridge between two or more regional trade subnetwork, in the process, maintaining a connection with peripheral geographical areas otherwise completely isolated. Finally, the eigenvector centrality measures the capacity of a country to have significant influence in the global trade. The idea behind the last index of centrality consists on the fact that a national entity that possess a strong direct trade flow with states characterized by an high degree centrality should have a stronger ability to have a significant impact with its actions in the surrounding environment.

**METHODOLOGY:**The calculation of the four different centrality indexes above illustrated has been conducted by means of "Social Network Visualizer (SocNetV)", which is a cross-platform software application for social network

analysis and visualization. In particular, the flows of bilateral trade among the first fifty world exporter countries have been converted in a social network by means of the creation of an adjacency matrix, where each element  $a(x;y)$  is equal to 1 in case of the edge from node  $x$  to  $y$  (that is the country  $x$  has an exports volume versus the country  $y$  above a well specified threshold), or equal to 0 if the nodes are not connected (the trade flow from country  $x$  to country  $y$  is below the threshold). The adjacency matrix is then imported in the SocNetV and drawn as graph, where vertices depict the national entities and edges represent the first two significant commercial trades, in order to partially reduce the influence of the traded volume on the centrality indexes.

The EII is obtained following a well-defined algorithm, taking into consideration each one of the four centrality indexes used to quantify the position of each national entity within the international trade flow network. In particular, the EII is a weighted sum of the all centrality indexes, in which: (i) the degree centrality and the eigenvector centrality contribute for a 50% of their values, in order to mitigate the influence of the higher volume of trade related to the major countries; (ii) the closeness centrality and the betweenness centrality, which describe the national ability to be in contact with each national entity of the global network and to be a bridge among eventual sub networks, wholly contribute with their values; (iii) the highest centrality index among the four one, is additionally added to the partial weighted sum resulting from (i) and (ii), in order to attribute a more relevant weight to the most significant centrality index for each country.

**RESULTS:** In table 1, the specific value (expressed as percentage of the whole value in the network) of the degree centrality, the closeness centrality, the betweenness centrality, the eigenvector centrality and the relative economic intelligence index (calculated according the algorithm above described) for the first 25 countries in terms of import are illustrated (being the EII a relative index, half of the national entities turn out to have a value of the centrality indexes close to zero).

Table 1 - The Economic Intelligence Indexes of the First 25 Countries in Terms of Import

	Degree	Closeness	Betweenness	Eigenvector	EII		Degree	Closeness	Betweenness	Eigenvector	EII
US	0,220	0,001	0,343	0,333	0,964	Japan	0,020	0,052	0,007	0,000	0,121
Germany	0,210	0,003	0,202	0,000	0,521	UAE	0,020	0,052	0,007	0,000	0,121
Canada	0,020	0,001	0,126	0,250	0,512	France	0,050	0,002	0,034	0,000	0,111
China	0,180	0,001	0,149	0,167	0,503	Italy	0,030	0,034	0,012	0,000	0,096
Mexico	0,010	0,001	0,000	0,167	0,256	Netherlands	0,010	0,034	0,010	0,000	0,084
Poland	0,010	0,103	0,013	0,000	0,225	India	0,010	0,034	0,007	0,000	0,081
Russia	0,010	0,103	0,013	0,000	0,225	SaudiArabia	0,010	0,034	0,007	0,000	0,081
Turkey	0,010	0,103	0,010	0,000	0,221	Norway	0,010	0,021	0,007	0,000	0,054
Brazil	0,010	0,103	0,005	0,000	0,217	UK	0,020	0,009	0,015	0,000	0,054
Spain	0,010	0,103	0,000	0,000	0,212	CzechRepublic	0,020	0,017	0,005	0,000	0,052
Singapore	0,010	0,103	0,000	0,000	0,212	Belgium	0,020	0,015	0,007	0,000	0,052
Hong Kong	0,040	0,001	0,010	0,083	0,155	Slovakia	0,020	0,015	0,002	0,000	0,047
Sweden	0,020	0,052	0,010	0,000	0,123						

Source: author's owner

According to the results of the investigation, the US, Germany, China, thanks probably to the fact they represent the major countries in terms of importing value, possess a high value of EII and, in the process, a strong capability to implement a sound and valuable national EI strategy. However, among the first positions in terms of high EII are also present countries with a lower value of importing value, such as Mexico, Canada, Poland, Russia, and even Turkey and Brazil. In such cases, the predisposition to develop an effective and efficient national EI system mainly derives to their ability to occupy a strategic position in the international trade network: (i) Canada and Mexico have a high value in the eigenvector centrality, due to the fact they have a strong relationship with the US; (ii) Poland, Russia, Turkey and Brazil have a relative high value in the closeness centrality, which means they are in a good position to influence directly or indirectly the international relation system.

**CONCLUSION:** In the last decades, the globalization increased the complexity of the international economic relation systems. Each country, on the basis of its position in the international relations system, has a well-defined ability to develop and use information asymmetries. The analysis conducted in this article by means of the social network analysis methodology has showed how it is possible to measure, by means of the Economic Intelligence Index, the capability of the main national entities in the world to face the threats and the risks with a proper economic intelligence strategy. However, further researches could be conducted in order to quantify the importance of the position of each national entity in the system of the global relations, by identifying different types of networks. Thus, for example, the social network analysis applied to the world Internet backbone, would show the countries more active in the information and communication technologies and, in the process, with a higher inclination to implement cyber intelligence strategies. Again, the analysis of the network of the air transport intercity linkages, would be useful to identify the states with a greater control on the people-flow movements.

## REFERENCES

1. Caligiuri, M., (2016), *Intelligence e Scienze Umane*, Rubbettino Editore, Soveria Mannelli.
2. Clerc P., (1997), *Economic Intelligence, World Information Report 1997-1998*, Unesco Publishing, Paris, 1997, Chapter 22, pp. 304-317.
3. Jean C., (2012), *Geopolitica del Mondo Contemporaneo*, Editori Laterza, Bari.
4. Jean C., Savona P., (2011), *Intelligence Economica. Il Ciclo dell'Informazione nell'Era della Globalizzazione*, Rubbettino Editore, Soveria Mannelli.
5. Morbidelli M., (2005), *Intelligence Economica e Competitività Nazionale*, working paper, Centro Militare di Studi Strategici, Roma, October 2005.
6. Potter E. H., (1998), *Economic Intelligence & National Security*, Carleton University Press, Carleton.
7. Starostina A. O., Adami C., (2016), *The Role of the Economic Intelligence in the Modern International Economic Relations*, Zukovskis, J.,

Shaposhnykov K., Innovations in the Development of Socio-Economic System: Microeconomic, Macroeconomic and Meso-economic Levels, Aleksandras Stulginskis University, Lithuania, pp.1-15.

8. Wasserman S., Faust K. (1994), Social Network Analysis. Methods and Applications, Cambridge University Press, Cambridge.

УДК 658.8:339.1:339.9

## ***РИЗИКИ ЛОГІСТИЧНОЇ ДІЯЛЬНОСТІ ПІДПРИЄМСТВ В УМОВАХ НЕСТАБІЛЬНОСТІ ЗОВНІШНЬОГО СЕРЕДОВИЩА***

**Трушкіна Н.В.**

к.е.н., старший науковий співробітник відділу проблем регуляторної політики і розвитку підприємництва Інституту економіки промисловості НАН України

**Кітріш К.Ю.**

аспірантка Інституту економіки промисловості НАН України

**Шкригун Ю.О.**

аспірантка Інституту економіки промисловості НАН України

Організація логістичної діяльності підприємств є прямо залежною від різних видів ризиків. Це зумовлює актуальність питання управління ризиками логістичної діяльності в системі ризик-менеджменту підприємств з метою пошуку якісно нових підходів до їхньої мінімізації, а у сучасних умовах невизначеності та мінливості ринкового середовища – до імплементації максимально ефективних превентивних заходів з метою запобігання виникнення подальших кризових ситуацій.

Під ризиками логістичної діяльності підприємств розуміється ймовірність настання подій, що призводять до збитків і втрат через виникнення простоїв, зривів у ланцюзі поставок і порушення стійкості логістичної системи [1].

У щорічному Звіті про ризики «Resilience360» визначено 10 найвпливовіших ризиків на розвиток глобальних ланцюгів поставок. Серед них такі:

- загроза кібератак – у 2019 р. у результаті порушень безпеки даних виявлено 4,1 млрд пошкоджених записів. Очікується, що збитки, які завдано кіберзлочинністю, досягнуть до 2021 р. 6 трлн дол. на рік [2]; значний вплив на поширення фінансових махінацій має розповсюдження коронавірусу як суспільної кризової ситуації, у зв'язку з чим різко збільшився загальний трафік;
- зміни у торговельній політиці – у 2020 р. невизначеність, яка пов'язана з кількома поточними торговельними переговорами продовжуватиме стримувати процес прийняття рішень у ланцюгу поставок для багатьох компаній;
- посилення економічних санкцій, які мають безпосередній вплив на організацію ланцюгів поставок;