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## **DEGREE OF INTERNATIONALIZATION IN MESOECONOMIC PERSPECTIVE**

**Summary:** Although the degree of internationalization (DOI) is currently a well known concept, it still remains underresearched. It is most frequently cited in terms of firm's international process, but it is much less applied for other levels of analysis. In this article we aim to propose an index of outward DOI that could be used for industry internationalization. We try to replicate Sullivan's methodology except for the weights of components that we base on a Delphi study among Polish managers. We rank 73 Polish industries according to a DOI index composed of four single measures.

**Keywords:** degree of internationalization, mesoeconomics, industry, multi-item scale.

### **Introduction**

The last two decades of globalization process have profoundly altered the way manufacturing and service industries operate. The relocation of core and supplementing activities enabled companies to implement cost-cutting strategies and in the same time to reinforce their presence outside the domestic market [Contractor et al., 2010]. Thus, while thinking about an industry it is no longer so obvious where to draw the limits of their functioning.

While analyzing the balance payments of economies we tend to draw attention to how much each economy has imported and exported and see which of the industries bear the biggest share of the trade. While studying internationalization process much more attention has been given to the manufacturing industries rather than to service ones [Orava, 2002]. However, year-to-year services account for about 30% of the world trade, therefore while looking at an economy

we should adapt a holistic view and analyze all of the within existing industries. Therefore in this paper we aim to assess and compare how internationalized manufacturing and service industries are.

## 1. Degree of internationalization in international business studies

Internationalization scope is a concept broadly used and undertaken in the international business research [Sullivan, 1994; Petri, 1994; Hassel et al., 2001; Ietto-Gillies, 2002]. The reasoning for the matter is quite simple – internationalization is commonly linked with, on the macroeconomic level – possible growth acceleration and on the microeconomic level – with firm financial performance.

DOI can be viewed from different perspectives that are interrelated and not necessarily mutually exclusive. Therefore if we look at the scope of activities we can refer to inward and outward DOI. If we refer to the level of analysis we normally evoke micro-, meso- and macroeconomics (Table 1).

**Table 1.** Possible levels of analysis in DOI

Specification	Microeconomics	Mesoeconomics	Macroeconomics
Outward	Scope of company's activities outside the country	Scope of industry's/ region's business activities outside the country	Scope of country's business activities outside the country
Inward	Scope of company's willingness to import components, goods, etc.	Scope of industry's/ region's willingness to import goods or attract foreign capital	Scope of country's willingness to import goods or attract foreign capital

The DOI that refers to firm's activities has been quite extensively covered [e.g. Sullivan, 1994; Stewart, 1997; Szymura-Tyc, 2013]. They mostly refer to TNs since more data on their performance is available. The data is also gathered on the macroeconomic level and normally published in various reports (e.g. UNCTAD, OECD). What we very rarely come across is DOI index that would cover the mesoeconomic level. The EBSCO research shows only four records that deal with the DOI measurement in terms of industries [Vahlne & Nordstrom, 1993; Thai and Chong, 2008; Tuselman et. al., 2008; Asakawa & Rose, 2013]. Except for the Transnationality Indexed applied by Tuselman et. al. [2008] all the other measures are only a descriptive, non-operationalized notion. Therefore in the following sections we propose a measure that, we feel, could be introduced into various empirical studies.

## **2. The mesoperspective in the degree of internationalization**

Since DOI has been so far neglected in terms of industry performance, we could come to a simple conclusion that perhaps it is not worth considering. Perhaps the previously fixed distinction between micro- and macro-level is enough? Some could and undoubtedly will claim so. However as Ietto-Gillies [2002] indicates this phenomenon does create a research gap both in terms of the concept and methodology used.

Mesoeconomics is a dynamic concept that brings in a cooperative approach, highlights relations between entities and their interdependence [Gorynia, 1993, Górka, 2013]. It also sets research boundaries in different directions – either as regions or as industries. Both determinants – geography and activities performed – enables researchers to draw their own limits to the scope of study. In this study we refer to industries only as they require different measures than regions. Industries are aggregated according to a different perspective clustering together entities that perform a similar activity, not necessarily being located nearby one another.

Advocating in favor of composing an industry DOI index we would like to present some arguments of why it might be worth studying. Theories of internationalization tend to match international activities with business cycles and natural stages of company's progression [e.g. Vahlne, Ivarsson & Johanson, 2011]. However even as many reach the same stage of industry evolution, they do not exhibit the same 'willingness' for foreign ventures. Our first step, included in this paper, is to evaluate how internationalized different industries are and hopefully in the future to cross-examine them with other countries. Eventually it would be worth verifying to what different industries owe their level of internationalization. Finally, we wish to see if and how industry DOI influences the economic performance of a country (e.g. GDP structure). However to even attempt any of the further research we need a decent index that would enable us to rank the Polish industries.

## **3. Methodology – applying Sullivan's idea into mesoeconomic perspective**

Nunnally's [1978] item-total analysis is used for constructing the DOI index for the industry internationalization. We follow Sullivan's [1994] method in constructing it, therefore we verify inter-correlation and alpha Cronbach coefficient, we conduct the factor analysis and check the normality of distribution.

Finally, we deviate in one point from Sullivan's approach. Although we note his point [Lawshe & Shucker, 1959; Sullivan, 1996] that DOI as an universal index applied to different population should ideally have equal weights of components, we decide to conduct a study among managers (Delphi method) to verify their perception of variables' importance. The index should not only be statistically correct, but should also reflect the business reality [see also Szymura-Tyc, 2013].

### **3.1. Sample**

All of the European Union Members are required to follow the Eurostat regulations over the statistical classification of the economic activities. The Member States are however allowed to introduce their own versions of the classification provided its accordance with the European regulations. It is mandatory that the country specific classifications derive from the NACE classification. In this study we sampled the economic activities (hereby understood as industries) from the Central Statistical Office of Poland and the PontInfo Gospodarka database as well as Eurostat database. Therefore we based the analysis according to the PKD 2007 classification which is an adoption of the NACE Rev. 2 version. We refer to divisions which group the economic activities by the character of the goods and services delivered, its purpose and the technology used for its production. Similarly to Sullivan [1994] we conducted the research in the time-line of three years (2010-2012).

According to the structure of the Polish economy, there are 88 divisions within 21 sections. Due to the data availability we take into consideration only 73 divisions. The missing information concerned mostly sections S, T and U which, due to their specificity, are not particularly of much interest to the study. The industries included represent production, service and trade entities.

### **3.2. Variables**

The selection of the indices used for the construction of composite index was different than in the case of company internationalization. According to the literature review DOI is characterized in three dimensions [Sullivan, 1994]: performance, structure and attitude. With industry internationalization it is virtually impossible to aggregate all of the three dimensions on the mesoeconomic level. The attitude expressed by managers' orientation towards foreign ventures is most likely to be omitted. Therefore for the industry DOI we limit the analysis to the performance and structure.

We suggest that the outward internationalization index composes of the following indices:

- Industry foreign sales to total sales ratio (FSTS),
- Companies' internationalization ratio (CI),
- Industry entry mode dominant (EMD),
- Industry scale of foreign activity (SFA).

FSTS is said to be the most commonly applied measure of the company's international activity [Stopford & Dunning, 1983; Daniels & Bracker, 1989; Geringer, Beamish & da Costa, 1989]. As it does not raise any controversies we will not dwell on that particular item. Another variable describing the process of the industry internationalization is CI, operationalized as the number of companies making foreign sales to number of companies making sales in both domestic and foreign markets. It is a measure that distinguishes firm and industry DOI. It is useless while analyzing microeconomic data but on the aggregated level it gives a holistic view over an industry. Although the FSTS for two industries might be similar it does not immediately mean that it was achieved in similar manner. Another, quite possibly better measure for the structure of an industry is the concentration measure (Herfindahl index), however, we lack data to introduce it into the study.

DOI is also characterized by the willingness of the companies to undertake equity commitment. EMD is estimated on the bases of the outward FDI. We do not make a more detailed and thus sophisticated distinction between possible entry modes.

The first attempt to operationalize the SFA was to assess the average number of foreign markets that the industry makes sales in [Ramaswamy, Kroeck & Renforth, 1996]. However, by doing so we overlook e.g. the physic distance. Since this concept is also frequently questioned, finally we have agreed on using a rather unique measure: number of companies exporting outside the European Union to the total number of companies exporting both within and outside the European Union. At first sight, the measure might seem unrelated, however, it does picture the scale of industry internationalization. As the trade regulations within the European Union are much simplified and apply to all Member States it is much easier for the Polish companies to undertake intra-EU activities. With the customs and other outside UE regulations the willingness to undertake international activities is expected to drop. Therefore, we feel that this measure is an adequate operationalization.

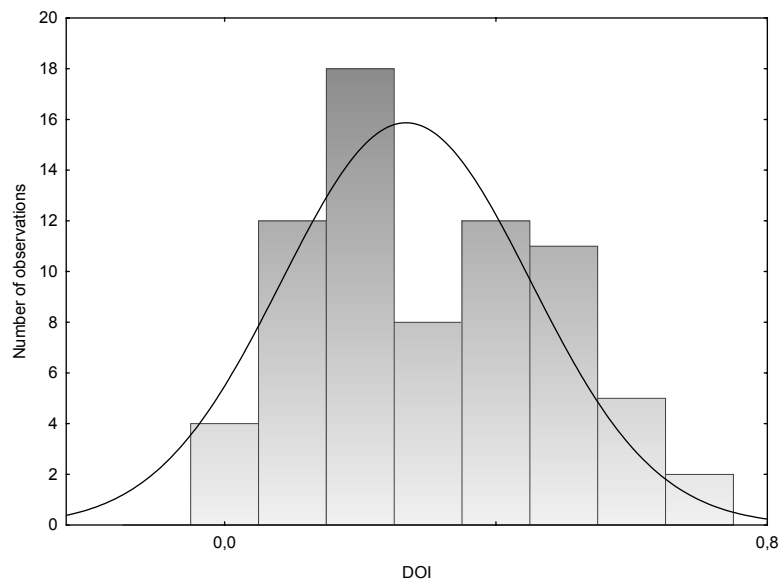
### 3.3. Results

Before running the analysis we have transformed the data. Afterwards the item-total analysis was conducted on the 4 variables mentioned before. The alpha coefficient which is used for testing the reliability was 0.622396. It is less than the normally approved 0.7, however the literature review reveals studies when values above 0.6 were also accepted [e.g. Szymura-Tyc, 2013]. While analyzing the item-total correlation none of the variables fell below the threshold of  $r \geq 0.3$  (Table 2) obtaining as follows: FSTS (0.47), CI (0.51), EMD (0.31) and SFA (0.42).

**Table 2.** Statistics and correlations for the reliability test

Variable	Item-total correlation	Alpha when excluded
Industry foreign sales to total sales ratio (FSTS),	0.467734	0.502470
Industry scale of foreign activity (SFA)	0.419851	0.571326
Companies' internationalization ratio (CI)	0.506531	0.470554
Industry entry mode dominant (EMD)	0.309633	0.620358

The factor analysis followed, indicating that a single factor comprised our DOI for the industry. The distribution test (Figure 1) showed an asymmetry – many of the industries still remain less internationalized.



**Figure 1.** Distribution of the DOI index

For each industry we treated the variables as lineal combination and added them. However, unlike Sullivan [1994] we have added weights for each of the components. The weights were established on the basis of two-round Delphi study conducted on 25 managers<sup>1</sup>. Eventually, the weights were assigned as follows:

$$\text{DOI} = 0.4 \cdot \text{FSTS} + 0.3 \cdot \text{CI} + 0.2 \cdot \text{SFA} + 0.1 \cdot \text{EMD}.$$

The index can take values between 0 and 1, where 0 stands for absolute lack of international activities and 1 means the highest possible international involvement (Table 3).

**Table 3.** DOI Index for the Sample Industries in Poland (2011)

Industry	DOI	Industry	DOI
1. Manufacture of motor vehicles, trailers and semi-trailers	0,815772	38. Rental and leasing activities	0,218956
2. Manufacture of computer, electronic and optical products	0,634097	39. Employment activities	0,210527
3. Manufacture of machinery and equipment n.e.c.	0,608896	40. Other mining and quarrying	0,198242
4. Manufacture of furniture	0,587906	41. Scientific research and development	0,198016
5. Manufacture of other transport equipment	0,565210	42. Advertising and market research	0,19185
6. Other manufacturing	0,536776	43. Architectural and engineering activities; technical testing and analysis	0,182425
7. Manufacture of textiles	0,508338	44. Wholesale and retail trade and repair of motor vehicles and motorcycles	0,180887
8. Manufacture of rubber and plastic products	0,502443	45. Retail trade, except of motor vehicles and motorcycles	0,180605
9. Manufacture of basic metals	0,499437	46. Sports activities and amusement and recreation activities	0,178865
10. Manufacture of coke and refined petroleum products	0,490959	47. Telecommunications	0,164361
11. Manufacture of basic pharmaceutical products and pharmaceutical preparations	0,471929	48. Education	0,154288
12. Manufacture of paper and paper products	0,467821	49. Mining of coal and lignite	0,15395
13. Office administrative, office support and other business support activities	0,453914	50. Land transport and transport via pipelines	0,152054
14. Manufacture of fabricated metal products, except machinery and equipment	0,452240	51. Food and beverage service activities	0,150791
15. Warehousing and support activities for transportation	0,451231	52. Construction of buildings	0,149810

<sup>1</sup> The study was conducted via an e-online questionnaire. The managers were representatives of 25 companies of both production and service industries.

Table 3 cont.

Industry	DOI	Industry	DOI
16. Manufacture of electrical equipment	0,450734	53. Travel agency, tour operator reservation service and related activities	0,133143
17. Manufacture of wearing apparel	0,450127	54. Other professional, scientific and technical activities	0,127332
18. Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	0,417126	55. Publishing activities	0,119687
19. Financial service activities, except insurance and pension funding	0,406485	56. Waste collection, treatment and disposal activities; materials recovery	0,112868
20. Printing and reproduction of recorded media	0,391657	57. Activities of head offices; management consultancy activities	0,105249
21. Repair and installation of machinery and equipment	0,377515	58. Real estate activities	0,087253
22. Computer programming, consultancy and related activities	0,371903	59. Activities auxiliary to financial services and insurance activities	0,086951
23. Manufacture of other non-metallic mineral products	0,360041	60. Services to buildings and landscape activities	0,081153
24. Manufacture of chemicals and chemical products	0,356922	61. Programming and broadcasting activities	0,079991
25. Air transport	0,351948	62. Accommodation	0,077479
26. Manufacture of food products	0,344492	63. Electricity, gas, steam and air conditioning supply	0,071068
27. Manufacture of leather and related products	0,343106	64. Sewerage	0,065272
28. Information service activities	0,338828	65. Motion picture, video and television programme production, sound recording and music publishing activities	0,064523
29. Manufacture of tobacco products	0,322936	66. Civil engineering	0,056538
30. Specialized construction activities	0,311598	67. Water collection, treatment and supply	0,053929
31. Mining support service activities	0,306077	68. Security and investigation activities	0,053440
32. Legal and accounting activities	0,281282	69. Human health activities	0,024485
33. Crop and animal production, hunting and related service activities	0,270911	70. Veterinary activities	0
34. Manufacture of beverages	0,260829	71. Residential care activities	0
35. Wholesale trade, except of motor vehicles and motorcycles	0,245246	72. Social work activities without accommodation	0
36. Other personal service activities	0,240404	73. Gambling and betting activities	0
37. Remediation activities and other waste management services	0,224726		



On average, manufacturing industries are more internationalized than service industries. The descriptive statistics show us that an average DOI for manufacturing is 0.367 and for service industries 0.169<sup>2</sup>. Service industries had lower ranks in all of the components taken into account.

## Conclusions

According to the literature review industry DOI has scarcely been the point of interest among the researchers [see Vahlne & Nordstrom, 1993; Thai & Chong, 2008; Tuselman et. al., 2008; Asakawa & Rose, 2013]. One of the most common approaches is to identify DOI as merely the level of international sales (FSTS). It is however in our view insufficient. The index proposed is one of very few attempts to operationalize the phenomenon. It captures different dimensions of the industry internationalization process. In further research we hope to prove its utility in different research areas, especially by determining its relations with industry transaction costs level and industry performance.

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<sup>2</sup> We excluded three industries that are in fact trade industries. Their DOI average was 0.202 which is higher than service industries but lower than manufacturing industries.

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### KONCEPCJA POZIOMU INTERNACJONALIZACJI W PERSPEKTYWIE MEZOEKONOMICZNEJ

**Streszczenie:** Mimo iż stopień internacjonalizacji (DOI) jest konceptem powszechnie znanym, wciąż rzadko się stosuje badania z jego wykorzystaniem w praktyce. Najczęściej wykorzystuje się go przy badaniu procesu internacjonalizacji przedsiębiorstw, jednak zdecydowanie rzadziej w przypadku rozważań nad innymi poziomami analizy (w tym branżowej). Celem niniejszej publikacji jest, opierając się na osiągnięciach Sullivana, stworzenie indeksu zewnętrznej internacjonalizacji branży. Wagi indeksu zostały przypisane na podstawie badania metodą delficką. Indeks ten został następnie wyliczony dla 73 branż polskiej gospodarki.

**Słowa kluczowe:** stopień internacjonalizacji, mezoekonomia, branża, mierniki wielowymiarowe.