International Journal of Development and Economic Sustainability
Vol.3, No.4, pp.80-90, August 2015
Published by European Centre for Research Training and Development UK (www.eajournals.org)

THE ATTRACTIVENESS OF INVESTMENT IN THE ARAB COUNTRIES: COMPARATIVE STUDY

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ABSTRACT: *The flow of investments in developing countries differs across countries. We have been focusing on this research on foreign direct investment as one type of foreign investment due to the lack of capital markets in some Arab countries. Investment comprises foreign direct investment (FDI) their role is one of these kinds of investments that inflows have provided the strong impetus for economic development across countries. The paper tries to make a comparison between Poland and some Arab countries in stability period in Arab region 2005-2010. The results show that the Poland has the higher attractive investment while in key determinants factors some Arab countries are in better position than Poland.*

KEYWORDS: Attractive Investment, Key determinate's, Foreign Direct Investment, Arab countries, Poland, Composite indicator.

INTRODUCTION

With the beginning of the nineties of the last century, has accelerated the pace of economic and financial globalization, with the growing economic relations and financial relations between different countries. This situation contributed to the use of criteria and indicators to help countries and investors to make appropriate decisions to invest at the international level. These indicators provide a closer look at many important things (Brink, 2006, p. 7).

In this paper we address theoretically how to build composite indicators (or simply an index) to reach one number, allows for the classification of the economy of individual countries with regard to foreign investment attraction. This index which represents a wide range of measurements on the multiple aspects of a 'conceptual entity' such as cost of living, status of social wellbeing, or FDI attractiveness. An indicator's (index) main role is a quantification and simplification of information in a manner that promotes the understanding of investigated complex problems, to both decision-makers and the public. The method for index formation follows the approach of constructing composite indicators (Freudenberg, 2003; Michela, Giovannini, Hoffman, Tarantola, Saltelli, & Saisana, 2005; Castaings, Stefano, & Ari, 2008; Dalsgaard, 2013). The indicator construction involves a number of computation methods, and their theoretical grounds and offered options are described. Some methods used to assess the explanatory power of the resulted indicator are proposed. The final FDI attractiveness index, which embraces 13 Arab countries' economies, and Poland as reference country, allows their ranking and support the decision-making process of firms regarding the location of FDI.

Why we chose Poland not another country as a comparing country? The answer to this question is that:

- Poland is one's of the most European Union countries attractive for foreign investment in Central Europe;

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- Poland is relatively conservative and religious for a European society;
- Poland has the largest economy in Central Europe and is the "only' European Union country that recorded economic growth when other economies declined because of the financial crisis in 2009;
- Poland having own independent currency – Polish Zloty (PLN), and it is boasting a stable financial system;
- Poland is one's of the strongest stock exchanges and the largest sources of shale gas in Europe;
- Poland Given these relative advantages, and particularly the Polish path after the Communism and over 20 years of transformation experience;
- Poland may be at a historical crossroad, in effect, becoming one's of the leading European countries to be a model for Arab economies;
- This study may be the first study that comparing the investment attractiveness in the Arab countries in the Middle East and North Africa, with Poland to the period 2005-2010.

There are many composite indicators, which focus on different areas such as corruption, governance indicators, investment climate, economic factors, and others. To understand the importance of the indicators, in general, below are the pros and cons of the composite indicators (JRC Science Hub-European Commission, 2008, pp. 13-14; Saltelli, Nardo, Saisana, & Tarantola, 2005, p. 361; Michalos, Andrew, & Nazeem ; Mishra, 2007):

Pros

- the maker's policy decision can use the composite indicators for summaries complex or multi-dimensional issues to assist in decision-making;
- Instead of relying on many separate indicators, composite indicators provide the time and effort to reach a certain goal. Therefor help the task of ranking countries on complex issues, therefore assess progress of countries over time;
- composite indicators can help attract public interest by providing a summary figure that helps to compare the performance of different countries and that progress over time;
- Composite indicators can add more information for a wide range of indicators, thus reducing the number of indicators.

Cons

- composite indicators may send misleading, non-robust policy messages if they constructed poorly or misinterpreted. Sensitivity analysis can use to test composite indicators for durability;
- the building of composite indicators involves stages where rules have to make: the choice of sub-indicators, choose the model, weighting indicators and treatment of

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missing values etc. These judgments should transparent and based on sound statistical principles;

- Composite indicators give flexibility there could be more scope for countries about composite indicators better from one indicator.

Using composite indicators, increasing the size of the data needed to measure because the required data for all the sub-indicators.

LITERATURE REVIEW

Many studies have addressed the issue of the attractiveness of foreign direct investment, and many studies have focused on the motives of investment. The literature presenting the composite indicators in different applications is ample. *UNCTAD's Investment Compass* is an interactive software tool designed to policy analysis and is compares the investment environment. The *DHAMAN FDI Attractiveness Index* is a composite measure of the attractiveness of the host of foreign direct investment the country. Index ranks a set of (111) country. The index issued by AT Kearney Inc., has been prepared using the raw data from the property survey administered to senior executives of the leading companies in the world. The sample includes (300) companies in (26) countries.

Review of Foreign Direct Investments Attractiveness Assessment Methods

Single level indicators produce an indicator (index, measure) based of a set of individual indices, measuring important attributes (determinants, characteristics) of inward FDI attractiveness. Contribution of individual indices to resultant index is defined by their weights.

Multi-level (hierarchical) indicators divide the set of indices into e.g. three levels, organized in tree structure: individual FDI determinants describing different aspects of FDI attractiveness are the leaf nodes of the tree. That are grouped into key indices, forming the second level of the hierarchy, and the root level, as one composite measure of FDI attractiveness?

Another classification of composite indicator depends on determination of an ideal object and ranking all objects at hand according to their "distance" from this ideal, called pattern (sometime as development pattern). One of such approach was introduced by (Hellwig, 1968), where pattern was defined based on standardized object's attributes (characteristics). Classified as "stimulants" (attributes values increase for objects treated as better ones), "DE stimulants" (attributes values increase for objects treated as worse). Such classified attributes are used to determine the "ideal" object, making up a coordinates of pattern in the space of objects' attributes. All objects are the points in this space, and their ranking is evaluated as function of their distance from the "ideal". Another approach defines the "ideal" direction in the space of attributes (Nermend K. , 2006; Nermend K. , Taxonomic Vector Measure of Region Development , 2007). Method of ranking using "ideal" direction is called the synthetic vector method. This approach is used as basic methods for object's ranking in the scope of this paper.

Synthetic Vector Measure

Procedure for the construction of synthetic vector measure encompasses five steps: selection, elimination and normalization of variables, determining the pattern and anti-pattern as well as a synthetic vector measure see

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Figure1.

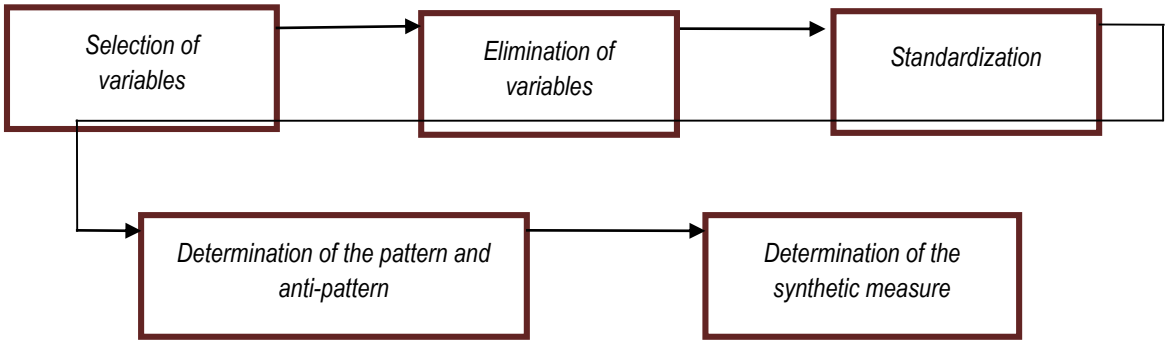

Figure1. Steps of synthetic vector measure construction.

Source: (Nermend K. , Vector Calculus in Regional Development Analysis: Comparative Regional Analysis Using the Example of Poland, 2009).

Selection of variables step is crucial for the success of synthetic vector measure application, and at the same time is the less formalized than the other steps involved in measure construction. Which variables are potentially most useful in representation (or discrimination) of analysed phenomenon depends on subject matter at hand, and should be decided by expert in this domain. Phenomenon/objects are characterized by a set of *n* attributes (variables, features), and results of their measurements (observations) on all m objects are organized as *m x n* data matrix X, (Nermend K. , Vector Calculus in Regional Development Analysis: Comparative Regional Analysis Using the Example of Poland, 2009):

$$X = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n1} & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n1} & x_{2n} \\ \cdots & \cdots & \cdots & \cdots & \cdots \\ x_{m11} & x_{m12} & \cdots & x_{m1n1} & x_{m1n} \\ x_{m1} & x_{m2} & \cdots & x_{mn1} & x_{mn} \end{bmatrix}$$

where:

m - number of objects,

n - number of variables,

x_{ij} – value of j.*th* variable for the i.*th* object

Elimination of variables step consists of assessment of individual variable usefulness based on its variability. Elimination of variables is usually performed by using significance

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coefficient characteristics, (Nermend K. , Vector Calculus in Regional Development Analysis: Comparative Regional Analysis Using the Example of Poland, 2009):

Standardization of variables. Variables used in the studies are heterogeneous; in fact they describe different properties of objects. For this reason, the step to be performed in the construction of the synthetic measure is to standardize the variables. This process not only leads to the elimination of units of measurement but also to the normalization of variable values.

Determination of the pattern and anti-pattern. After normalizing the variables, the next step is the design pattern of development. Collected variables are divided into stimulants and de stimulants (Hellwig, 1968). The criterion of division is the impact of each of the selected variables on the level of development of the units. Variables, which have a positive, stimulating effect on the level of units, are called stimulants, as opposed to inhibitory variables, or so called de stimulants. Sometimes the optimal level of development for a given variable is achieved, which is then called the nominate. In the Hellwig's measure, a pattern is defined on the basis of the values of variables. The coordinates of the pattern in Hellwig's measure are defined as the maximum value of stimulants and minimum value of de- stimulants. The nominate are usually transformed into stimulants or de stimulants. In vector measures, it is not the position of the pattern that is important but rather the direction (vector) indicating positions of the best objects. The direction is determined based on the pattern that is characterized by high values of both stimulants and de stimulants. Anti-pattern and pattern can be taken as real objects. Based on first and third quartile (Nermend K. , Vector Calculus in Regional Development Analysis: Comparative Regional Analysis Using the Example of Poland, 2009), it is also possible to automatically determine both the pattern and the anti-pattern.

Determining the synthetic measure, in the vector space, the values of the variables in the examined objects are interpreted as coordinates of the vectors. Each object represents a specific direction in space. The difference in pattern and anti-pattern is also a vector designating the direction in space. Along this direction, the value of synthetic measure is calculated for each object. This measure could be seen as one-dimensional coordinate system. In view of this, the process of determining the measure becomes the process of determining the coordinate in the coordinates system, which can be shown through the formula (Nermend K. , 2006; Nermend K. , Taxonomic Vector Measure of Region Development , 2007):

$$m_i = \frac{\sum_{j=1}^{n}(y_{ij} - y_{aw,j})(y_{w,j} - y_{aw,j})}{\sum_{i=1}^{n}(y_{w,j} - y_{aw,j})^2}$$

where:

m_i – synthetic measure,

y_{ij} – object,

$y_{aw,j}$ – anti-pattern,

$y_{w,j}$ – pattern.

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Analysis of Attractiveness of Arab Countries and Poland Using Vector Methods

In this paper, we shall use the input data that we accorded to the three groups of factors. We refer to these groups in table (1). We try to have our score, and ranks to our sample, using (16) of factors from three kind of groups. Our choosing to these factors was because they are available to our sample countries, and because our thought that using three groups can give a clear view about the impact of factors to attract investment. Taking into consideration that these groups can overlap, and sometimes difficult to differentiate between them. Our test in this section will be to all the simple Arab countries and Poland as comparing country.

Table1.Factors Specification and Sources of Information, 2005-2010.

Group Factors	Factors	Source of indicators
Economic factors	GDP growth (annual %), GDP per capita (constant 2005 US$), GDP per capita growth (annual %), Trade (% of GDP), Tax payments (number), Inflation, GDP deflator (annual %), Imports of goods and services (% of GDP) Urban population (% of total)	World Data Bank
	Labor force, total	Joint Arab Economic Reports
Social factors	Secondary education, general pupils Electricity production (kWh)	World Data Bank
Political factors	Political Stability (-2.5 to 2.5), Rule of Law (-2.5 to 2.5)	Worldwide Governance Indicators
	Transparency	Transparency Index created by the Transparency International organization
	Time to export(days), Time to import(days)	Worldwide Governance Indicators

Source: author's elaboration.

In the first step we shall discuss the statistical parameters of (16) selected variables (determinants), used to stand for (13) Arab countries and Poland. Variables are gathered into three groups of parameters (key determinants): economic, social, and political. Collected data cover the period from the period 2005-2010.

The result shows in the average years 2005- 2010, (table2) the high value score of vector measure was (100) to Poland. Egypt was at the second rank with a score (81.05). Saudi was at the third rank with a score (80.87). Qatar position was at the rank (4) with a score (71.52). Followed by Morocco, at the rank (5) with a score (57.99) in the average years 2005-2010 Algeria was at the rank (6) with a score (56.52). Kuwait was at the rank (7) with a score (55.90). Tunisia was in the rank (8) in the average period 2005-2010, with a score (50.14). Followed by Bahrain, it is score was (48.52). UAE, was at the rank (10) with a score (47.12) in the average

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years 2005-2010. Oman was at the rank (11) with a score (46.89). Jordan was at the rank (12) in the average period 2005-2010 with a score (42.19). Lebanon was in the rank (13) with a score (40.33). Iraq was at the last rank (14) with the score (0).

Table2.Composite measure of Arab countries and Poland using vector measures averaged data for the period 2005-2010.

Country	Vector measure	Economic Key determinant	social Key determinant	political Key determinant
Poland	100	100	64.24	78.80
Egypt	81.06	62.14	100	52.31
Saudi	80.88	65.31	82.09	62.43
Qatar	71.52	68.34	3.04	100
Morocco	58.00	65.05	18.96	55.48
Algeria	56.52	60.51	37.30	42.57
Kuwait	55.90	48.28	13.87	78.05
Tunisia	50.15	45.08	9.25	71.25
Bahrain	48.53	41.92	0	79.25
UAE	47.12	14.91	23.74	93.88
Oman	46.89	29.95	3.39	89.05
Jordan	42.19	30.65	5.27	74.06
Lebanon	40.33	54.59	2.74	37.28
Iraq	0	0	12.35	0

Source: author's elaboration.

Analysis of Factors Influencing Investment Attractiveness in Arab Countries (compared to Poland)

We shall analysis the factors influencing FDI attractiveness using separated country to the average period 2005-2010. Relate key determinants achieved for individual Arab countries in the same period with corresponding values for Poland (see the Figure2 below). Whereas; Economy: Economy factors; Social: social factors; and Political: Political factors.

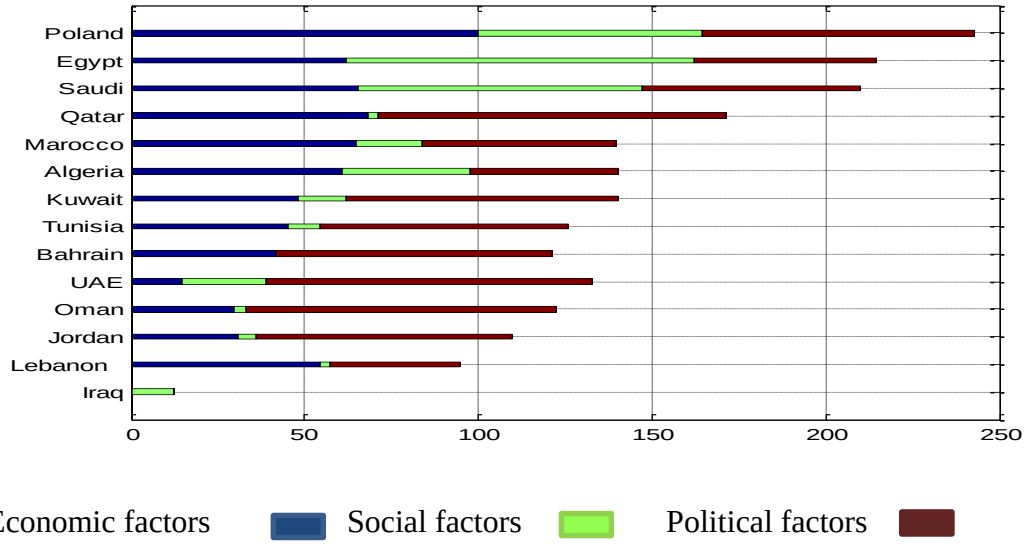

Figure2.FDI attractiveness scores vector measures for the period 2005-2010.

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Source: author's elaboration.

The results for a separated country as below:

Algeria: It is clear from the *figure (1)*, that Poland has a better position than Algeria in the average period 2005-2010. The score of vector measure of Poland was (100) while to Algeria was (56.52) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Algeria rank (6) to the same simple to the same factors (See appendix 34). In the social factors, the score of Poland was (64.24), while Algeria score was (37.30). In the political factors, Poland has a score (78.80), while Algeria has a score (42.57).

Bahrain: It is clear that Poland has a better position than Bahrain in the average period 2005-2010. The score of vector measure of Poland was (100) while to Bahrain was (48.53) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Bahrain rank (9) to the same simple for the period 2005-2010 (See appendix 34). We can see from the figure that Poland has the score (100) in economic factors while Bahrain has the score (41.92) to the same factors. In the social factors, the score of Poland was (64.24), while Bahrain score was (0). In the political factors, Bahrain has a better score than Poland, which has a score (78.80), while Bahrain has a score (79.25).

Egypt: It is clear from the *figure*, that Poland has a better position than Egypt in the average period 2005-2010. The score of vector measure of Poland was (100) while to Egypt was (81.06) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Egypt rank (2) to the same simple for the period 2005-2010 (See appendix 34). We can see from the figure that Poland has the score (100) in economic factors while Egypt has the score (62.14) to the same factors. In the social factors, the score of Poland was (64.24), while Egypt has a better score than Poland with a score (100). In the political factors, Poland score was (78.80), while Egypt has a score (52.31).

Iraq: It is clear from the *figure*, that Poland has a better position than Iraq in the average period 2005-2010. The score of vector measure of Poland was (100) while to Iraq was (0) at the last of the list of our simple countries in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Iraq rank (14) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors while Iraq has the score (0) to the same factors. In the social factors, the score of Poland was (64.24), while Iraq has the score (12.35). In the political factors, Poland score was (78.80), while Iraq has a score (0).

Jordan: It is clear from the *figure*, that Poland has a better position than Jordan in the average period 2005-2010. The score of vector measure of Poland was (100) while to Jordan was (42.19) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Jordan rank (13) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors while Jordan has the score (30.65) to the same factors. In the social factors, the score of Poland was (64.24), while Jordan has score (5.27). In the political factors, Poland score was (78.80), while Jordan has a score (74.06).

Kuwait: It is clear from the *figure*, that Poland has a better position than Kuwait in the average period 2005-2010. The score of vector measure of Poland was (100) while to Kuwait was (55.90) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries

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of our study while Kuwait rank (7) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors while Kuwait has the score (48.28) to the same factors. In the social factors, the score of Poland was (64.24), while Kuwait has score (13.87). In the political factors, Poland score was (78.80), while Kuwait was close to Poland and has a score (78.05).

Lebanon: It is clear from the *figure*, that Poland has a better position than Lebanon in the average period 2005-2010. The score of vector measure of Poland was (100) while to Lebanon was (40.33) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Lebanon rank (13) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors, while, Lebanon has the score (54.59) to the same factors. In the social factors, the score of Poland was (64.24), while Lebanon has score (2.74). In the political factors, Poland score was (78.80), while Lebanon score was (37.28).

Oman: From the *figure*, it is clear that Poland has a better position than Oman in the average period 2005-2010. The score of vector measure of Poland was (100) while to Oman was (46.89) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Oman rank (11) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors, while, Oman has the score (29.95) to the same factors. In the social factors, the score of Poland was (64.24), while Oman has score (3.39). In the political factors, Poland score was (78.80), while Oman was better with a score (89.05). This is a result to the higher key determinant political of Oman in the period 2005-2009, comparing with Poland.

Qatar: From the *figure*, it is clear that Poland has a better position than Qatar in the average period 2005-2010. The score of vector measure of Poland was (100) while to Qatar was (71.52) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Qatar rank (4) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors, while, Qatar has the score (68.34) to the same factors. In the social factors, the score of Poland was (64.24), while Qatar has score (3.04). In the political factors, Poland score was (78.80), while Qatar was a better with a score (100). This is a result to the higher key determinant political of Qatar in the period 2005-2010, comparing with Poland.

Saudi: From the *figure*, it is clear that Poland has a better position than Saudi does in the average period 2005-2010. The score of vector measure of Poland was (100) while to Saudi was (80.88) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Saudi rank (3) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors, while, Saudi has the score (65.31) to the same factors. In the social factors, Saudi was better than Poland, the score of Poland was (64.24), while Saudi has score (82.09). This is a result to the higher key determinant social of Saudi in the period 2005-2010, comparing with Poland. In the political factors, Poland score was (78.80), while Saudi was better with a score (62.43).

Tunisia: From the *figure* it is clear that Poland has a better position than Tunisia in the average period 2005-2010. The score of vector measure of Poland was (100) while to Tunisia was (50.15) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while Tunisia rank (8) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors, while, Tunisia has the

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score (45.08) to the same factors. In the social factors, Tunisia was better than Poland, the score of Poland was (64.24), while Tunisia has score (9.25). In the political factors, Poland score was (78.80), while Tunisia score was (71.25).

UAE: From the *figure* it is clear that Poland has a better position than UAE in the average period 2005-2010. The score of vector measure of Poland was (100) while to UAE was (47.12) in the average period 2005-2010. Poland rank was (1) among the (14) simple countries of our study while UAE rank (10) to the same simple for the period 2005-2010. We can see from the figure that Poland has the score (100) in economic factors, while, UAE has the score (14.91) to the same factors. In the social factors, the score of Poland was (64.24), while UAE has score (23.74). In the political factors, Poland score was (78.80), while UAE was a better with a score (93.88). This is a result to the higher political key determinant of UAE in the period 2005-2010, comparing with Poland.

CONCLUSIONS

1. The results show that Poland has a better situation in attractiveness investment than the 13 Arab countries.

2. In social key determinants Egypt was in better position than Poland.

3. We should take in minds; in the social factors, in some Arab countries there is no possibility to grow significantly. In these Arab countries have a limited options to increase the social factors, because the limited number of population, and economy size. So when we analysis the data of some Arab countries such (Bahrain, Jordan, Kuwait, Oman, Lebanon, Tunisia, and UAE) we can see these details.

4. Qatar was in better position than Poland in political key determents.

5. Iraq has a special feature, the fact that Iraq fought through several decades many wars, led to the destruction of the infrastructure. Iraq also suffered from the economic blockade from 1990 until 2003. There are many factors used in the input search necessarily reflect the social and economic reality of what Iraq has passed through. In spite of the great economic and human potential possessed by Iraq.

BIBLIOGRAPHY

Brink, B. t. (2006, September). Indicators as Communication Tools: An Evolution Towards Composite Indicators. *Working Paper WPR2-2006-D3b*. Tilburg, Netherlands: ECNC – European Centre for Nature Conservation.

Castaings, W., Stefano, T., & Ari, L. (2008). The 2007 European e-Business Readiness Index. *OECD Statistics Working Paper JT00188147*. Directorate General Joint Research Centre and Directorate General for Enterprise and Industry.

Dalsgaard, M. T. (2013, May). An Assessment of FDI Attractiveness A comparative study of emerging economies . *Bachelor Thesis*. Aarhus , Denmark: Aarhus University.

Freudenberg, M. (2003, November 12). Composite Indicators of Country Performance A Critical Assessment. *OECD Science, Technology and Industry Working Papers*. Paris, France: OECD Publishing.

2053-2199 (Print), 2053-2202(Online)

Hellwig, Z. (1968). Zastosowanie metody taksonomicznej do typologicznego podziału krajów ze względu na poziom ich rozwoju oraz zasoby i strukturę wykwalifikowanych kadr. *Przegląd statystyczny 4, 307-326.*

JRC Science Hub-European Commission. (2008). Handbook on Constructing Composite Indicators. *Methodology and User Guide*. Paris, France: OECD Publications.

Michalos, A. C., Andrew, S., & Nazeem , M. (n.d.). *An approach to the canadian index of wellbeing*. Retrieved February 14, 2015, from http://creativecity.ca/cecc/downloads/indicators-2006/Michalos-Sharpe-Muhajarine-Approach-CdnIndex-Wellbeing.pdf

Michela, N., Giovannini, E., Hoffman, A., Tarantola, S., Saltelli, A., & Saisana, M. (2005, August 09). Handbook on constructing composite indicators. *OECD Statistics Working Paper*. OECD.

Mishra, S. K. (2007, June 1). *A comparative study of various inclusive indices and the index constructed by the principal components analysis.* Retrieved February 14, 2015, from SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=990831

Nermend, K. (2006). A synthetic measure of sea environment pollution. *Polish Journal of Environmental Studies*, 127-129.

Nermend, K. (2007). Taxonomic Vector Measure of Region Development . *Polish Journal of Environmental Studies*, 195-198.

Nermend, K. (2009). *Vector Calculus in Regional Development Analysis: Comparative Regional Analysis Using the Example of Poland.* Berlin: A Springer Company.

Saltelli, A., Nardo, M., Saisana, M., & Tarantola, S. (2005). Composite Indicators - The Controversy and the Way Forward. In OECD, *Statistics, Knowledge and Policy Key Indicators to Inform Decision Making: Key Indicators to Inform Decision Making* (pp. 359-372). Palermor: OECD.

2053-2199 (Print), 2053-2202(Online)