Hacettepe University Institute of Social Sciences
Department of Economics

HEALTH SYSTEM PERFORMANCE IN OECD COUNTRIES: DATA ENVELOPMENT ANALYSIS

Elif Göksu Öztürk

Master's Thesis

Ankara, 2016

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Elif Goksu Ozturk tarafından hazırlanan "Health System Performance In Oecd Countrıes: Data Envelopment Analysıs" başlıklı bu çalışma, 21 Aralik 2016 tarihinde yapılan savunma sınavı sonucunda başarılı bulunarak jürimiz tarafından Yuksek Lisans Tezi olarak kabul edilmiştir.

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Elif Göksu ÖZTÜRK

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Bu çalışmadaki bütün bilgi ve belgeleri akademik kurallar çerçevesinde elde ettiğimi, görsel, işitsel ve yazılı tüm bilgi ve sonuçları bilimsel ahlak kurallarına uygun olarak sunduğumu, kullandığım verilerde herhangi bir tahrifat yapmadığımı, yararlandığım kaynaklara bilimsel normlara uygun olarak atıfta bulunduğumu, tezimin kaynak gösterilen durumlar dışında özgün olduğunu, Tez Danışmanının Ünvanı, Adı SOYADI danışmanlığında tarafımdan üretildiğini ve Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Yazım Yönergesine göre yazıldığını beyan ederim.

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ÖZET

Öztürk, Elif Göksu *OECD Ülkeri Sağlık Sistemleri Performansı: Veri Zarflama Analizi,* Yüksek Lisans Tezi, Ankara, 2016.

Sağlık ekonomisi ülkelerin gelişmişlik seviyesi, etkililiği ve etkinliğini ölçmek için kullanılan en önemli ekonomi alanlarından biridir. Her ülke, içinde bulunduğu ekonomik, kültürel ve sosyal duruma göre kendi sağlık politikasına kendisi karar verir. Bu politikaların karar merkezindeyse genel olarak sağlık finansmanları ve sınırlı kaynakların kullanımı göz önünde bulundurulmaktadır. Bu noktada dünyada kullanılan dört ana sağlık sistemi modelinden bahsetmek mümkündür. Bu modelleri; vergi ödemeleriyle finansmanını sağlayan Beveridge, işveren ve işçilerin sigorta ödemeleriyle finansmanını sağlayan Bismarck, hem vergi hem sigorta ödemeleriyle finansmanını sağlayan National Health Insurance System (Ulusal Sağlık Sigortası Sistemi) ve son olarak direk olarak özel ödemeleri temel alarak sağlık sistemini finanse eden Out-of-Pocket oluşturmaktadır. Bu tezin temel amacı az önce adı geçen sağlık sistemlerinden hangilerinin ülkelerin sağlık sistemleri performansı üzerinde daha etkili olduğunu keşfetmektir. Bu çalışma yapılırken sağlık sistemlerinin kaynakları ve finansal sağlık modellerinin farklılıkları göz önünde bulundurularak OECD ülkelerinin sağlık sistemleri performans seviyeleri arasındaki farklılıklar bulunmaya çalışılmıştır. Veri zarflama analizi ülkelerin etkililik seviyelerini açıklamak için kullanılmıştır. Veri zarflama analizi sonuçlarına göre, hangi sağlık sistemi modelinin diğerlerine göre daha iyi olduğu tartışılmıştır. Beklenen Yaşam Süresi ve Bebek Kurtulma Oranı çıktı verileri olarak alınırken, Kamu Sağlık Harcamaları, Özel Sağlık Harcamaladır, Gayri Safi Yurtiçi Hasıla ve Doktor Sayısı girdi verileri olarak çalışmaya dahil edilmiştir. Veri aralığı sözü geçen tüm girdi ve çıktı veriler için 2000 yılından 2014 yılına kadar ki 15 seneyi kapsamaktadır. Çalışmaya Veri Zarflama Analizi uygulanmadan önce, seçilen verilerin genel çerçevesini göremek ve güvenilirliğinden emin olmak için doğrusal regresyon analizi yapılmıştır. Veri zarflama analiziyle elde edilen sonuçlar geçmiş çalışmaların bulduğu sonuçlarla uyumluluk göstermektedir.

Anahtar Sözcükler: Veri Zarflama Analizi, Sağlık Ekonomisi, Sağlık Sistemi Modelleri, Doğrusal Regresyon Analizi

ABSTRACT

Öztürk, Elif Göksu. *Health System Performance in OECD Countries: Data Envelopment Analysis*, Master's Thesis, Ankara, 2016.

Health economics is one the most important areas of economical science to measure countries' development levels, efficiency and effectiveness. Every country implements their own health policy according to countries' economic, cultural and social situations. These policies mainly include an arrangement about health financing and usage of limited health resources. There are four main health financing approaches in the literature, which are Beveridge based on tax payment to provide healthcare services to their citizens, Bismarck based on employer and employees payroll deduction to provide healthcare services to their citizens, National Health Insurance based on both tax payments and insurance to provide healthcare services to their citizens and Out-of-Pocket based on directly private payments to provide healthcare services to their citizens. The main purpose of the study is to understand the effect of these different health system models on healthcare system performances. In this dissertation, taking into account the resources of health systems and the differences in their financing models, diversities were tried to be found between the OECD countries' health system performance levels. Data Envelopment Analysis (DEA) was implemented to determine efficiency levels of countries. According to DEA results, the question as to which health system model is better was discussed. Life Expectancy and Infant Survival Rate were chosen as output variables. Public Health Expenditures, Private Health Expenditures, GDP per Capita and Number of Physicians were chosen as input variables. Data on the above variables from 2000 to 2014 were used in this thesis. Before the DEA implementation, linear regression analysis was implemented to see the general frame and the robustness of the data. Efficiency results mainly show compatibility with previous studies' results.

Key Words: Data Envelopment Analysis, Health Economics, Health System Models, Linear Regression Analysis.

CONTENTS

LIST OF ABBREVIATIONS

BBC	Banker, Charnes, and Cooper
CCR	Charnes, Cooper and Rhodes
CRS	Constant Returns to Scale
DEA	Data Envelopment Analysis
DMU	Decision Making Unit
DW	Durbin Watson Test
FDH	Free Disposable Hull
GDP	Gross Domestic Product
HCQI	The Healthcare Quality Indicator
HSE	Health System Efficiency
NHS	National Health System
OECD	Organization for Economic Co-operation and Development
PCA	Principal Component Analysis
PPP	Purchasing Power Parity
SFA	Stochastic Frontier Analysis
SHI	Social Health Insurance
UK	United Kingdom
US	United States
VIF	Variance Inflation Ratio
VRS	Variable Returns to Scale
WHO	World Health Organization

GRAPH INDEX

FIGURE INDEX

TABLE INDEX

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1. INTRODUCTION

Healthcare expenditures serve a big function in evaluating countries, since healthcare system is directly related to the economic development level. (Hadad , Hadad , & Simon-Tuval , 2011) A fast growing demand of public services prompts countries to improve their health outcomes, education, research and development (R&D) systems, or briefly their economies. One of the most important development index of economies is the healthcare expenditures on Gross Domestic Product (GDP). Healthcare expenditures have long been acknowledged as an important parameter on country development level. However; several researchers in the literature show that the size and the government's policy on healthcare can also impact these expenses. Thus, we should not interpret country's development level only by their expenditures.

There are many health care policies conducted by governments for reaching high development levels on health care. In general, these models can be grouped into three major types: Beveridge, Bismarck and National Health Insurance Models (WHO, 2000).

The **Beveridge model** was firstly implemented in England. In this system, patients never get doctor bills. Government finances the healthcare expenditures with high tax rates. This system can be called as tax based system, basically. Every healthcare services are provided by the government. On the other hand, the **Bismarck model** was first implemented in Germany (Kutzin , 2011). In contrast to the Beveridge model, healthcare funding is provided by employers and employees through payroll deduction in Bismarck model. This system may determine a kind of social health insurance system. (Kutzin , 2011) The **National Health Insurance Model** has some aspects of elements from both Beveridge and Bismarck. (WHO, 2000)

This thesis analyses and comparisons of the healthcare finance models across Organization for Economic Co-operation and Development (OECD) countries are being used for current health output and input data. Following part of the thesis includes detailed explanation of health system models. In this process, advantages and disadvantages of these models over each other will be discussed and the model used by OECD countries

will be analyzed. The second part of this research involves some descriptive information about differences of health system and health system performances. Then, efficiency and effectiveness will be discussed. Finally, Data Envelopment Analysis (DEA) and its graphical explanation will be introduced. Life Expectancy and infant survival rate will be used as outputs in the DEA model. Per capita GDP, number of physicians and healthcare expenditure rates will be used as an input variables. For measuring financing and funding system differences, expenditure rate will be separated into public and private expenditure on health systems. The effects of these indicators on health care systems will be determined. Moreover, there will be a broad literature review about previous studies in third part of the study. After these theoretical parts, the empirical analysis part will commence. OECD countries will be separated with respect to their health care system, then, according to the selected inputs and outputs, DEA will be implemented. Before DEA implementation, some statistical analyses will be generated to see the general frame of data and time effect. Finally, countries will be compared with each other according to conclusions and there will be a discussion about which healthcare system is better.

1.1. THE MODEL OF HEALTH SYSTEMS

From the beginning of the history, people tried to protect and care for their health. In previous decades, herbal and spiritual treatments had been more common. Industrialization, population growth, epidemics and wars forced governments to create and organize health care systems and models for their inhabitants. Every country has a health system which they implement for providing their citizens with healthcare necessities.

According to definition of WHO, health is well-being completely from physical, mental and social aspects and disappearance of sickness. Besides, Health is one of the most important issues for every country. It affects all citizens. Likewise, it has effects on the country's development level. High health expenditures do not always indicate a higher development level, although health expenditures and development level of country shows a parallelism with each other. However, the size of country should not be ruled out.

Healthcare expenditure (health system cost) is an increasing burden for economies. Every country tries to provide easy access to healthcare services for their citizens in spite of controlling cost applications (Mirmirani & Lippmann , 2004). The report of World Health Organization (WHO), 2000 reorganized all countries according to their healthcare systems policies. Moreover, this report mentions that different health system models show up according to different social requirements.

There are three main models which can be separated according to their funding systems. These are Bismarck which is also known as Social Health Insurance (SHI); Beveridge is also known as National Health System (NHS) and National Health Insurance Model. There is one more a model implemented only by US, which is the Private Insurance System. Detailed information about these healthcare system models and countries that follow them are described below.

Beveridge Model was firstly implemented by UK in 1948. In this model, healthcare is financed and provided by government. Citizens can access all kind of healthcare services whenever they want without paying any bills. However, the citizens of the Beveridge Model countries pay higher tax rates for getting medical care when compared to other countries' citizens because government finances the health care through tax payments. The OECD members of this model are Australia, Denmark, Finland, Greece, Iceland, Ireland, Italy, New Zealand, Norway, Portugal, Spain, Sweden, Slovenia and UK. (Kutzin , 2011)

Bismarck Model was first implemented by Germany in 1883. Providers and payers of the system are private. Thus, private insurance plans are mainly financed by employers and payroll deduction. However, the system does not include any profit oriented purpose. Moreover, one of the main aims of the system is covering all citizens' needs indiscriminately. Main attributes of this system are non-profit and government-run. The OECD members of this model are Austria, Belgium, Czech Republic, Estonia, France, Germany, Hungary, Israel, Japan, Luxembourg, Netherlands, Poland, and Slovakia. (Kutzin , 2011)

National Health Insurance Model can be accepted as a mix of Beveridge and Bismarck health system models and it started in Canada. Providers of this system are private while payers are government-run insurance programs that are afforded through citizen's payments. In addition, they seek all healthcare systems from every part of their country (Lanode , 1981). This system is also a non-profit system. Moreover, costs of the system might be controlled by limiting the medical services or delaying the treatments of patients. Furthermore, pharmaceuticals and medical equipment are easy to access and more reachable for citizens. The only purpose of this system is to provide excellent healthcare services to everyone. The OECD members of this model are Canada, Korea, Turkey, and Mexico. (WHO, 2010)

Private Insurance Model (Out-of-pocket) is the special health care system of US. This system does not cover needs of the all the citizens. If the patient has no money, the government does not provide any healthcare system for them. All providers and payers of this system are private. The biggest part of the medical care should be afforded by patients themselves. The OECD members of this model are US, Chile and Switzerland (Switzerland had implemented Bismarck Health System Model after it started to implement Private Insurance Model in 2014) (WHO, 2014)

Bismarck and Beveridge healthcare finance models have been compared by Zee and Kroneman (2007). Health outcome variables (overall mortality rate, infant mortality rate and life expectancy at birth) and healthcare cost variables (healthcare expenditure per capita in (purchasing power parity) PPP USD$ and health expenditure as percentage of GDP) were available for 17 European countries over a long period of time (from 1970 to 2003 or 2004). One purpose of this study is to compare the health outcomes and the health expenditure correlations between the health models. In addition, the other purpose of the study was to recognize the level of satisfaction of the citizens. For measuring an indicator like that, previous survey results were included in the analysis. Satisfaction variables were taken from Eurobarometer studies. The conclusion of their study shows that after 1980s Bismarck model performance on mortality rates and life expectancy have been better than Beveridge model. There is no difference for infant mortality rate between the two types

of health model. Beveridge model has a better cost containment than the Bismarck model. However, citizens of the Bismarck countries are more satisfied than Beveridge countries.

The substantiality of human life is one of the most important and essential values and promoting and protecting the sustainability of human welfare is a prior issue for every country. The World Health Organization (WHO, 2010) report focuses and analyses three important health-funding problems of the countries. First problem is lack of resources. This problem appears to stem from technological and financial impossibilities. Second problem is over reliance on direct payments. Healthcare system does not only include direct treatment costs but also includes some non-direct costs such as consultation fees or medicines. This barrier might create a huge problem for citizens. Even if people have some insurance from government-base, payment obligation of all healthcare costs on time prevents many people' treatment when people need care. The last problem is inefficiency of health resources allocation. There is a range of 20-40% health resources waste every year. (WHO, 2010) If that kind of waste could be saved, health efficiency of countries would have been increased and the point of global coverage would have been reached. The recommendations of this report for countries about healthcare funding system will be detailed in the literature review part of the study. Moreover, several authors have compared healthcare systems between countries by addressing several issues: efficiency of healthcare system performances, health delivery systems, equity and availability of health resources or effectiveness. These issues will also be analyzed in the literature review. The main purpose of this thesis is to determine which funding policy performs better, regarding the health care provision to their citizens. According to the findings, better healthcare system (tax based or insurance base) will be determined. The performance analysis will be implemented through DEA. Thus, some details of DEA and the DEA models that are used during the research will be defined in the next section.

2. PERFORMANCE MEASUREMENT

2.1. CONCEPTS

Before the definition of healthcare system performance, healthcare systems providing contribution to improve performance criteria should be described and the border of the health system should be determined. According to WHO (2000), the main purposes of health systems are briefly to improve, to renovate and to sustain all activities about health. Explanation of health system is the basis of health systems performance evaluation and interpretation. Moreover, WHO (2000) included some definitions about the borders of health systems. The narrowest definition was to create the border of health care system activities which are directly under the control of health administration. Activities targeting to improve health level of community (e.g. increasing tax rates of tobacco or alcohol products for blocking that kind of harmful consumption) are out of this definition. The second definition is broader. Health systems include individual medical cares and non-individual healthcare services while inter-sectoral activities aiming to increase health system performances are not included in second definition. To clarify, traditional public health activities such as agricultural spraying or health information transfer are included while inter-sectoral activities such as clean water or sanitation programs are not included. The third definition considers that all activities aiming to make healthcare better are a part of the healthcare systems. This definition contain both non-individual and medical healthcare services and sectoral regulations aiming to decrease traffic accidental death rates etc. The last definition is the broadest. This definition contain every activity contributing to create better health system and does not include operational difference between educational, agricultural or health care services. (WHO, 2000). The third definition which includes both medical and individual health services aiming to improve to health level and inter-sectoral activities is the most appropriate definition according to WHO (2001). This definition provides a wider perspective from medical and individual services to the health system policy makers about how health services of community can be improved in areas such as nourishment, tobacco consumption or traffic safety arrangements.

Healthcare systems should aim to increase healthcare services that governments provide to the community, answer the expectations of the community, and provide protection against sickness or cost of health. (Uğurluoğlu & Çelik , 2005)

After defining healthcare systems, healthcare performance level can be defined as the efficiency and effectiveness of healthcare services provided by the healthcare system in government level. Governments try to reach higher level of efficiency, financial sustainability and fair healthcare allocation. Other dimensions of performance can be: Appropriateness which shows the level of relevant healthcare services; continuity which shows to the extension of healthcare services for patients over time, safety which shows the sufficient level of equipment and service to create benefit to the user or provider (Papanicolas & Smith, 2013). Another key dimension can be effectiveness. Obtaining desirable level of outcomes shows effectiveness. (Arah , Westert, Hurst , & Klazinga , 2006) Furthermore, there are two different kinds of definition to understand the effectiveness. One of them includes both patients who need to receive healthcare and individuals who don't need to receive health care. This effectiveness definition which includes both patients and individuals is also called macro-level effectiveness. Effects of physical, social and economic conditions on health of inhabitants generate the coverage of this definition. Second one is called micro-level effectiveness, which focuses on interactions between patients and providers. Benefit and satisfaction levels of patients create the frame of this clinical perspective. (Aday, et al., 1999) Meeting the expectations of clients and patients is one of the most important purposes of healthcare performances. Resources, financial attributes and quality evaluations are also important variables for measuring healthcare performance (Pransky , Benjamin , & Dembe , 2001). In addition, equity should also be considered within the definition of the healthcare performance. In other words, healthcare performances can be assessed according to distribution of the benefits and costs of individual and communal health care. However, to understand the real situation of public health and to measure health performance correctly, non-healthcare indicators such as environment, lifestyle and human biology etc. should be included. (Arah , Westert, Hurst , & Klazinga , 2006). Evaluation of healthcare performance provides some means for understanding countries' health system policies. Describing healthcare systems' deficiencies, understanding financial unfairness, answering citizen's expectations from health services and reaching similar healthcare

levels etc. can be analyzed with this evaluation. Moreover, healthcare performances' changes can be observed over time. (Silva de , 2000)

According to Murray & Evans (2003), low-, middle- and high-income countries face mainly five different problems when they try to reach a better healthcare performance level. The first of these is the lack of transparency about goals of health systems. Second is the financing of healthcare services. Third one is the inefficient control of resources. Fourth one is trying to use most-cost effective technologies for improving healthcare outcomes. Finally, the last problem is limited participation in the national health policy debates.

From the beginning of the 1980s health sector reforms began broadly in all of the world. Demographic, technological, and financial pressures forced these countries to maximize their efficiency and effectiveness. Moreover, improving quality of healthcare services and increasing patients' satisfaction became one of the most important goals of governments. (Saltman & Figueras , 1998). Countries' healthcare efficiency depends not only on adequate medical care but also on communities' behaviors and welfare (Hadad , Hadad , & Simon-Tuval , 2011). The efficiency of health systems or the effectiveness of the health care expenditures are an interest area for many researchers because the health sector is one of the most important areas reflecting the development level of countries (Alexander, Busch, & Stringer , 2003). Efficiency and equity are the most important keys for improving general public health. These two key goals include both economic and social objectives. If health expenditure or cost is conceived as a part of efficiency, there are two levels of calculation: 'macroeconomic level' and 'microeconomic level'. Macroeconomic level aims sustainability of health spending or finding the adequate ratio of health expenditure. (Arah , Westert, Hurst , & Klazinga , 2006) It includes total spending on health. Besides, other health related goods and services' effects on health costs are included by definition of macroeconomic efficiency. (Papanicolas & Smith, 2013) Microeconomic level aims decreasing the cost for same level of health outcomes. (Arah , Westert, Hurst , & Klazinga , 2006) It aims to reach maximum level of productivity by comparing the measured productivity of health systems. (Papanicolas & Smith, 2013)

Healthcare financing is also a very important factor for analyzing efficiency. The study of Kutzin (2013) is an explanatory study for understanding funding and financing of health systems. Kutzin (2013) tried to justify universal coverage (or universal health coverage (UHC) (UHC concept is firstly suggested by WHO (2010) report)) or understanding health financing reforms and schemes. WHO (2010) report has the following definition of health financing and UHC: ‘‘Financing systems need to be specifically designed to: provide all people with access to needed health services (including preventions, treatment and rehabilitation) of sufficient quality to be effective; and to: ensure that the use of these services does not expose the user to financial hardship.’’ ((WHO, Health system financing, 2010), Pp.6). Every government’s aim, when they are trying to implement a health care system, is to maximize health conditions like fair allocation of health services and public health, responsiveness, financial protection and equity in financing burden. The healthcare system should be created by using system performance functions which are the planning and management of resources, generating human and physical resources, service delivery and financing.

The objectives of health care financing policy are the distribution of the health funding costs and the minimization of the financial risk or the creation of a universal protection. The policy objectives have four main purposes, which are (i) supporting equal resource usage, (ii) creating transparency between system and population, (iii) improving quality of health delivery systems and (iv) promoting efficiency of healthcare organizations. (Kutzin , 2013)

The UHC definition from WHO (2010) is that all healthcare services should be equal and sufficient for all citizens and these services should be found easily whenever someone need them. This definition refers to effective coverage at the same time. Unfortunately, it is impossible to say that every country has a fully universal coverage level. Even if the countries achieve the universal financing protection for themselves, the gaps will always exist because not all the citizens can be aware of all of the health system services and match them with their own needs. Thus, there is no country which will reach an universal coverage level. (Kutzin , 2013)

According to WHO (2010) the extent of coverage includes population, service and cost. Population coverage refers to financial and services protection, cost coverage refers to financial protection, and services coverage refers to good quality and equal health care services. There are three goals associated with UHC: reducing the gap between the need and utilization, increasing quality and increasing financial protection. If the improvements are implemented only on the financial policies, this approach will not be enough for increasing quality and awareness of the people. Firstly, healthcare efficiency should be improved for enhancing health care coverage. Improving transparency can be specified in two ways: people's understanding of health care service usage and improving accountability of public resources as fairness of healthcare resources usage. 'Health financing for universal coverage' refers to support and increase the health care coverage at the population and system level. (Kutzin , 2013).

2.2. EFFICIENCY AND EFFECTIVENESS

Any healthcare system is to achieve effectiveness and efficiency. Efficiency and effectiveness are about the relationship of inputs, outputs and outcomes. Outputs are about the direct and tangible products resulting from the completion of activities while outcomes are the intended or achieved short term or medium term effects of outputs.

Figure 1 shows relationship between effectiveness and efficiency. As it can be seen in Figure 1, input variables may include monetary or non-monetary resources. All the processes depend on each other. Moreover, it is possible to see the distinction between the outcome and output easily. Simply, reducing blood pressure, cataract surgery or control of dementia should be considered as health outputs while life expectancy, mortality rates or quality adjusted life years should be considered as health outcomes.

In addition to these, definition of productivity may be useful to understand the concept. Productivity shows the efficiency of a system which creating useful outputs with raw materials or inputs given. Cost reducing is also one of the most important ingredient of productivity.

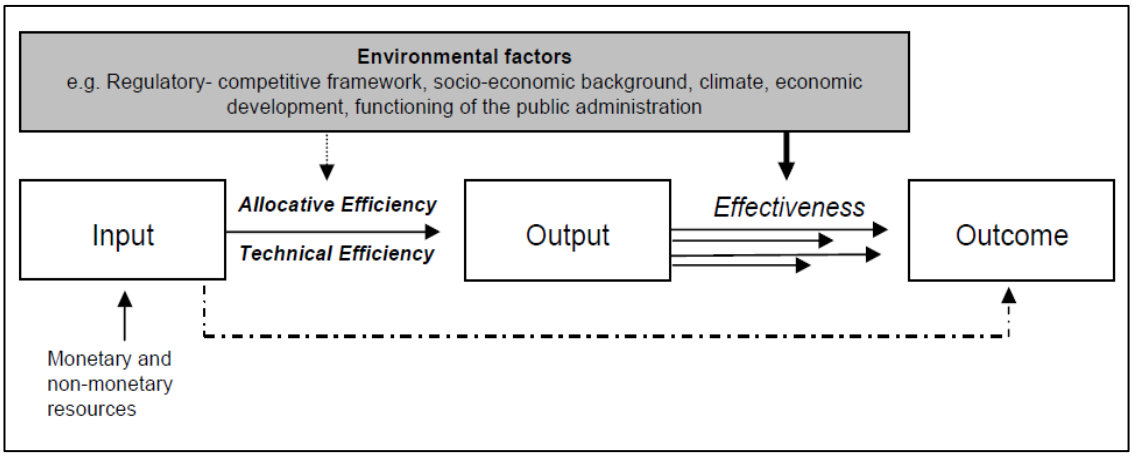


Figure 1. Conceptual framework of efficiency and effectiveness (Mandl , Dierx , & Ilzkovitz , 2008)

The relationship between the level of resources invested and level of health outputs show efficiency (Madore, 1993). In other words, efficiency can be defined as using the same amount of input to produce more output (Sherman & Zhu, 2006). Maximizing outputs effectively or maximizing health services delivery systems by using limited budget is the main purpose of efficiency. (Madore, 1993)

Assessing the effectiveness is harder than assessing efficiency. Effectiveness regards the achieved outcome not the cost reduction. It shows the effect of outputs achieved on outcomes. The important point is not to get the highest product level for effectiveness. The point is to get the highest benefit of achieved product level. (Mandl , Dierx , & Ilzkovitz , 2008). The effects of medical practices and techniques on health services for individuals are measured by effectiveness. (Madore, 1993) Effectiveness depends on the input or output to produce outcome to be aimed. Even if outcome mostly depends on the welfare and growth, it may be related to many different sort of factors, as well. Effectiveness include both clinical and economic approaches of healthcare. For example, if there are two drugs for the same health problem but one of them include less side effects on patient, it can be said that the drug with less side-effect is more effective. (Madore, 1993)

Limited resources require medical practices and techniques to be are used effectively. Stopping the funding on ineffective services may help to control health expenditures in a better way. (Madore, 1993)

According to Mandl et. al. (2008) efficiency concept and productivity measurement has a distinction on one level. As it is mentioned above, efficiency obtains given level of output with lower input level, however, the ratio of output produced to input used shows simply productivity.

2.3. DEA METHODOLOGY

In this study Data Envelopment Analysis (DEA) model will be implemented for measuring health system performance of OECD countries. This method is non-parametric and defines efficiency frontiers using linear programming techniques. DEA is one of the most common approaches for measuring health system performances, as will be clear below. Likewise, this method is also implemented for assessing the efficiency of other types of Decision Making Units (DMUs). (Asandului , Roman , & Fatulescu , 2014)

Data Envelopment Analysis was first introduced by Farell (1957) for creating better measurement methods for efficiency and productivity. Later Charnes, Cooper and Rhodes (1978) (CCR model) operationalized Farrell models and named them DEA.

DEA provides a comparison between similar DMUs with different quantity of input and outputs. (Soared De Mello, Lins, Soares dem Mello, & Gomes , 2002). There are two basic versions of DEA, one of them is input-oriented and the other one is output-oriented. In the input-oriented method, inputs are minimized for generating given levels of outputs. As for the output-oriented method, outputs are maximized for given amounts of inputs. (Asandului , Roman , & Fatulescu , 2014)

For understanding the difference between input and output oriented approaches, following figures will be helpful. Figure 2 and Figure 3 illustrate the efficient frontier and the input and output orientation in CCR model.

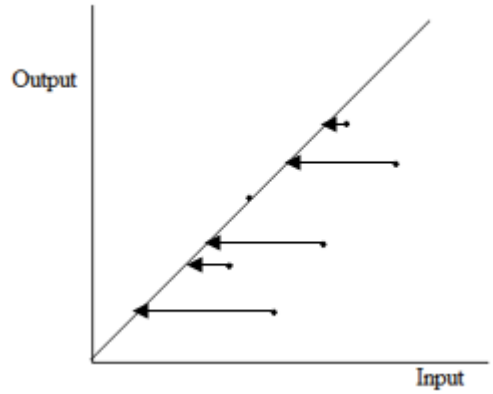


Figure 2.Projection frontier for the input-oriented CCR model

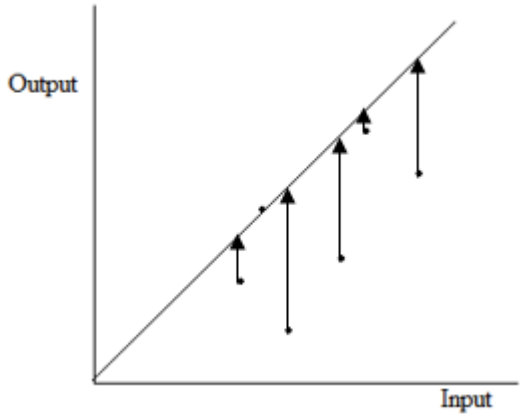


Figure 3. Projection frontier for the output-oriented CCR model

Inefficiency is the distance to the frontier. If the input oriented method is used to measure the efficiency level, the distance of inefficient points from horizontal line will be observed (Figure 2). On the other hand, if the output oriented approach is implemented, the distance of inefficient point form vertical line will be measured (Figure 3).

Projections of DEA can be observed in figures above. As it can be seen, the efficient frontier and DMUs are provided. All points except one, which is located on frontier, are inefficient. According to the figures, it can be stated that orientation methods may yield different projected values, but the efficiency score will be the same under the CCR model (Cooper, Seiford, & Zhu, 2004)

DEA model has two different approaches which are CCR and BCC. CCR model was first used by Charnes, Cooper and Rhodes (1978). This model considers constant returns to scale (CRS) and to find efficient outcomes, inputs and outputs are assumed proportional. (Soared De Mello, Lins, Soares dem Mello, & Gomes , 2002) Basic input and output oriented mathematical formulation of CRS model is shown in Table 1.

Input Oriented CRS Model	**Output Oriented CRS model**
Multiplier Model	Multiplier Model
$\max h_0(u,v) = \frac{\sum_{r=1}^{s} u_r\, y_{r0}}{\sum_{i=1}^{m} v_i\, x_{i0}}$	$\min h_0(u,v) = \frac{\sum_{i=1}^{m} v_i\, x_{i0}}{\sum_{r=1}^{s} u_r\, y_{r0}}$
Subject to (2.1)	Subject to (2.2)
$\frac{\sum_{r=1}^{s} u_r\, y_{rj}}{\sum_{i=1}^{m} v_i\, x_{ij}} \leq 1$	$\frac{\sum_{i=1}^{m} v_i\, x_{ij}}{\sum_{r=1}^{s} u_r\, y_{rj}} \geq 1$
$u_{r,}\ \ v_i \geq 0$	$u_{r,}\ \ v_i \geq 0$
j = 1, 2,….., n	j = 1, 2,….., n
i = 1, 2,….., m; r= 1, 2,….., s	i = 1, 2,….., m; r= 1, 2,….., s

Table 1. Constant Returns to Scale (CRS) input and output-oriented DEA models (in fractional program form or multiplier model) (Benneyan , Sunnetci , & Ceylan , 2008)

u_r = Represent weight of output r

y_{rj} = Represents the r^{th} output for j^{th} DMU

v_i = Represent weight of input i

x_{ij} = Represents the ith input for j^{th} DMU

As it is seen in the formulation, maximization process is applied for input oriented method because input oriented methodology aims to reach maximum amount of output by using minimum level of input as we mentioned before. Weighted sum of output and weighed sum of input are divided and maximum efficiency score is found. The opposite situation is observed for output oriented approach. As we infer from the above definition, output

oriented approach tries to find maximum level of output with minimum inputs. As it is seen in the formulation, minimization process is applied and weighted sum of input and weighted sum of output are divided. Weight of input, weight of output, all inputs and outputs have to be positive.

The above equations show fractional program form. After linearizing the multiplier models (in 2.1. and 2.2.) we can apply duality and arrive at the envelopment models shown in equation 2.3 and equation 2.4. Input and output oriented envelopment model of CRS model can be observed in Table 2,

Input Oriented CRS Model	**Output Oriented CRS Model**
Envelopment Model	Envelopment Model
$\min \theta$	$\max \phi$
Subject to (2.3)	Subject to (2.4)
$\sum_{j=1}^{n} x_{ij}\lambda_j \leq \theta x_{io}$; $i = 1,2,\dots\dots,m$	$\sum_{j=1}^{n} x_{ij}\lambda_j \leq x_{io}$; $i = 1,2,\dots\dots,m$
$\sum_{j=1}^{n} y_{rj}\lambda_j \geq y_{ro}$; $r = 1,2,\dots\dots,s$	$\sum_{j=1}^{n} y_{rj}\lambda_j \geq \phi y_{ro}$; $r = 1,2,\dots\dots,s$
$\lambda_j \geq 0$; $j = 1,2,\dots\dots,n$	$\lambda_j \geq 0$; $j = 1,2,\dots\dots,n$

Table 2. Constant Returns to Scale (CRS) input and output-oriented DEA models (in linear program form or envelopment model)

The purpose of linear program form is to provide immediate access to simplex and other methods for efficiently solving such problems. *(Cooper, Seiford, & Zhu, 2004)*

In order to consider a VRS model, a further constraint needs to be added to models 2.3 and 2.4 which is the convexity constraint:

$$\sum_{j=1}^{n} \lambda_j = 1$$

According to Cooper et. al. (2004) “This added constraint introduces an additional variable, into the (dual) multiplier problems. This extra variable makes it possible to effect returns-to-scale evaluations (increasing, decreasing, and constant).” Pp.13

CCR and BCC production frontier graphs can be observed below. It can be helpful to see the difference of these two DEA model visually. Figure 4 shows the CCR model production frontier while Figure 5 shows the BCC model production frontier.

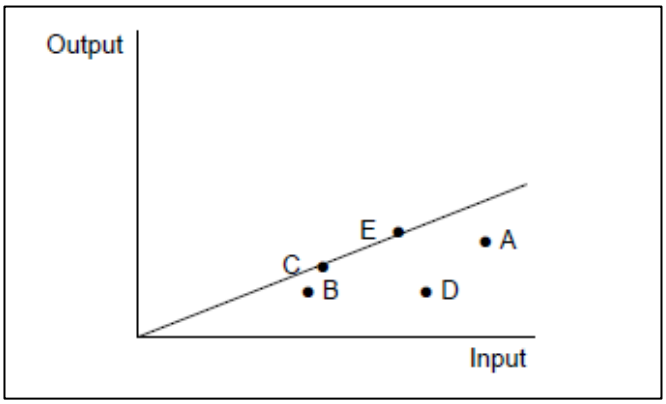


Figure 4. Production Frontier of the CCR Model (Mirmirani & Lippmann , 2004)

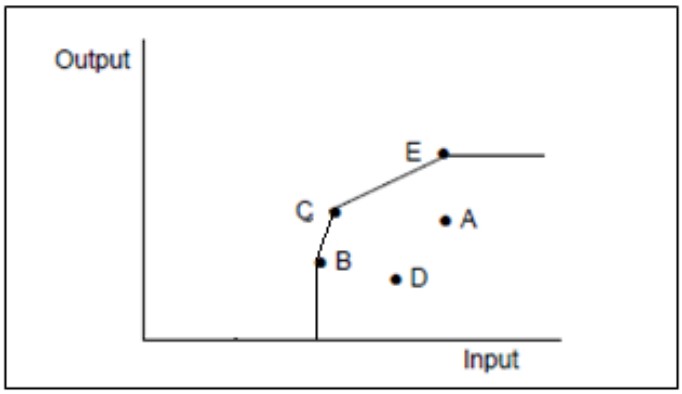


Figure 5. Production Frontier of the BCC Model (Mirmirani & Lippmann , 2004)

Both graphs show the cases of single input and single output. According to the Figure 4, C and E points which are located in frontier show efficient DMUs, while B, D and A show relatively inefficient DMUs while according to the Figure 5, points B, C and E show

the efficient DMUs and points D and A show the inefficient units. (Mirmirani & Lippmann , 2004)

2.3.1. Program Efficiency

Basic DEA model assumes that input and output variables are discretionary and controllable according to the used orientation model. Nonetheless, nondiscretionary or exogenously fixed inputs or outputs may appear in reality. (Fried, Lovell, & Schmidt, 2008)

Non-discretionary variables could be internal or external and to account for the effect of these variables, the frontiers separation is one of the approaches (Fried, Lovell, & Schmidt, 2008). This approach divides the DMU's based on some features or criteria. Under the frontier separation approach every DMU group is assessed according to the type they belong to. The efficiency scores of units computed in relation to their group frontier is the within-group efficiency or managerial efficiency. To isolate the effect of DMU which was calculated according to the group it belonged to, calculation is repeated without separation between the DMUs. Charnes et al. mentioned this as a program efficiency in their 1981 research. (Fried, Lovell, & Schmidt, 2008) However, Portela & Thanassoulis (2001) used this model in a simplified way by providing a huge time saving when target values are being calculated. So, it can be said that program efficiency is the ratio of inter and within efficiency and it provides calculation avoidance of target values. In other words, to calculate program efficiency, overall efficiency and managerial efficiency should be divided by each other.

Moreover, decomposition of the DMUs according to types they belong to make it possible to set units targets of achievement that can incorporate separate components of efficiency improvement for DMUs both in general and managerial base. (Portela & Thanassoulis, 2001)

It is possible to see the program efficiency visually in Figure 6.

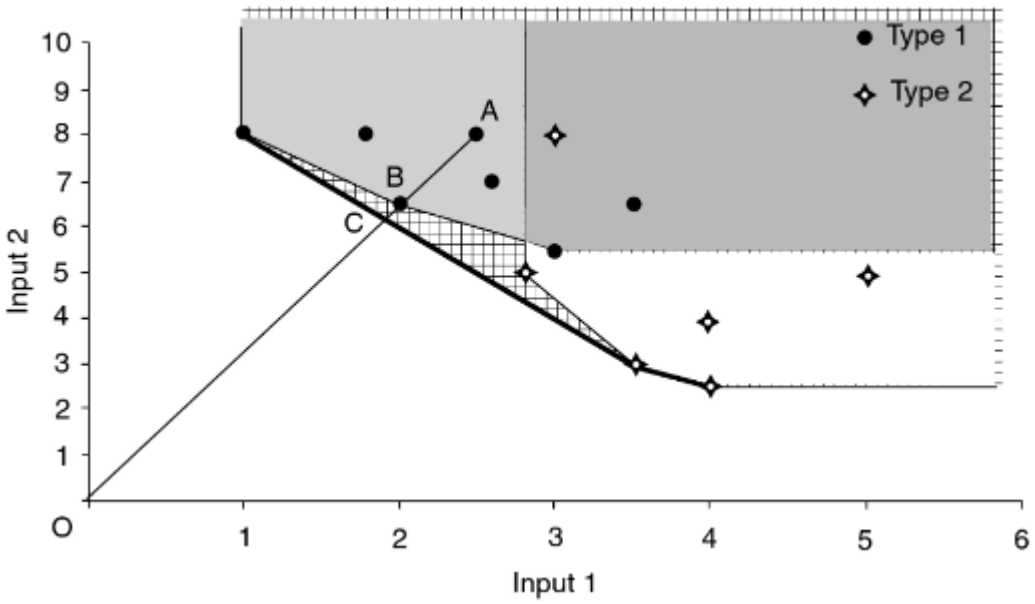


Figure 6. Illustration of Frontier Separation Approach (Fried, Lovell, & Schmidt, 2008)

As it can be seen from the Figure 6, that there are 2 different types of DMUs. These types have their own frontiers (thin lines) with their calculated within inter efficiency values. Moreover, meta-frontier (thick line) can also be observed – this frontier is the intersection of the within-type frontiers. Below equation shows how overall efficiency for unit A can be calculated and decomposed.

(OC/AC) = (OB/OA) x (OC/OB)
Overall Efficiency = Managerial (within) Efficiency x Program Efficiency.

Assessing the calculated efficiency values without any system separation provides the avoidance of the negative effects of calculated efficiency values with system separation. (Fried, Lovell, & Schmidt, 2008)

3. LITERATURE REVIEW

There are many researchers who tried to measure healthcare system performances of OECD countries in the literature. Effectiveness of health, efficiency of health systems and coverage, financing and allocation of resources etc. are the most important objectives of these analyses. These studies focused on different issues, used different methodologies, used different sets of the variables, and different number of years to achieve their aims. This literature review focuses on the various aspects of previous researches. In particular, the studies were addressed that used the same methodology as is used in this thesis (DEA).

3.1.ISSUE ADDRESSED

There are many researches that compare health system performances or efficiency level of countries in the literature. Most of these studies include a comparison between OECD countries or developed countries. Furthermore, there are some studies that preferred to classify their sample according to countries' economic situation as low, lower-middle, upper-middle and high income countries or countries which have low GDP rate and countries which have high GDP rate (e.g. (Alexander, Busch, & Stringer , 2003), (Benneyan , Sunnetci , & Ceylan , 2008)).

Arah et al. (2006) discussed healthcare system performances of OECD countries with a special framework which was created by OECD and named The Healthcare Quality Indicator (HCQI). The purpose of this framework was to compare health care indicators and quality of the healthcare across OECD countries. There are many reasons that lead the organizations or countries to measure their healthcare performances such as increasing costs and spending, aging population, lack of quality, medical lapses, inequalities etc. Public health and individualistic healthcare services were combined with each other by using obtainable function from authorized organizations such as ministry of health in order to describe all impacts of the activities and the structures concerning health on society. Briefly, the study tried to discover the role of health care in health system performance. Healthcare was conceived as one of the determinants of health. Similarly, Alexander et al (2003), Hadad et al. (2011) and after then Asandului et al.

(2014) tried to find the efficiency of healthcare systems of the selected countries. Besides, Puig-Junoy (1998) and Spinks & Hollingsworth (2005) aimed to investigate the technical efficiency of health production by measuring its relative performance. Greene (2003) created an alternative solution for analyzing a very controversial report of WHO (2000). This report includes a worldwide effectiveness of healthcare delivery evaluation. Mirmirani & Lippmann‘s (2004) study tried to find efficiency of healthcare delivery systems. The main discussion of the paper was the lack of universal healthcare coverage and a single player system. Moreover, which health system model should be followed by countries was tried to be determine. Healthcare efficiencies were measured. According to findings, some deductions were made about policy implications of the countries.

Grosskopf et al. (2006) measured healthcare efficiencies. The question was how efficiently health expenditures refers to better health? These measurement was made based on health expenditure level and financing of countries. Actually, this paper differs from the other studies regarding the methodology used. This study based on Malmquist approach to measure healthcare productivity alterations. Moreover, the study used the economic index number theory (and its components), quantity index and improvement index to determine well-established axiomatic properties and to understand the meaning of aggregate health outputs proxies. Asandului et al. (2014) tried to find a description about public efficiency of healthcare systems. The researchers claim that health care systems’ efficiency and health expenditures are directly related. Likewise, Grosskopf et al. (2006) suggest that healthcare expenditures and mortality rates are directly proportional. However, all the studies in the literature are not in the same path. According to Mirmirani & Ilacqua (2008), good healthcare measures like bed utilization etc. do not always guarantee of good healthcare systems. There are many other indicators which affect the countries’ health systems. Thus, more health expenditures cannot be the only indicator to determine better health conditions. Depending on countries surface and citizen number or social-economic situation, the balance of expenditure or health production might change. Countries may also obtain quite good healthcare outputs with low amount money. In this point, countries’ gross domestic product (GDP) and education level gain importance.

Although there are more indicators that affect the efficiency level of the countries, health expenditures are one of the most important indicator for measuring health performances level. Effectiveness and fairness of health expenditures are very important factors when evaluation is being made between the countries. Aging or alteration of tax rates might impact the evaluation of health expenditure level for both high and middle income countries (Asandului , Roman , & Fatulescu , 2014). One of the most important indicator for understanding development level of western countries is health expenditure rate. There are many variables for measuring healthcare efficiencies such as technological improvements, proximity of death, and decentralization of healthcare systems.

Healthcare expenditures rate increased from 6.3 percentage of GDP to 8.9 among OECD countries from the mid-70s. (Hadad , Hadad , & Simon-Tuval , 2011) In the literature, there are some studies that focuses especially on health expenditure and efficiency relationship. For example, Mills et al. (2001) performed some measurements which showed the relationship between health service inputs, the quality of health services and health expenditure level. Likewise, the study of Anell & Willis (2000) was implemented on OECD countries and a comparison was made between alternative health resources and health expenditure measures. As a combination of all of these studies, the main purpose of Varabyova & Müller, (2015) was to create a literature review combining all of the studies' results for observing some significant solutions on healthcare efficiency of OECD countries. Researchers collected 22 different healthcare efficiency studies which had implemented non-parametric or parametric measurement method for analyzing their studies. The study broadly categorized inputs into three categories: health resources, socio-economic factors and lifestyle factors. Socio-economic factors and lifestyle factors did not directly measure the health care inputs, however, these factors were frequently taken into account for the estimation of the production function because they might have an influence on the obtained production set. The environmental variables included socio-economic factors, lifestyle factors, policy variables and location characteristic. Input variables in the health resources category included public and private health expenditures; man power such as physicians, nurses, hospital beds, medical technologies and pharmaceuticals etc. Socio-economic factors represented education, income, measures of

unemployment and income inequality. Finally, lifestyle factors included tobacco consumption, alcohol consumption, dietary choices and pollution.

According to OECD (2009) US health expenditure rate on GDP is almost twice higher than OECD countries average health spending rate (Average of OECD %8.9 GDP, US %16 GDP) (Poças & Soukiazis, 2010). The main argument of the study of Andreson et al. (2003) starts from following idea: ‘’higher health spending but lower use of health services adds up to much higher prices in the US than in any other OECD country.’’ Total health expenditures -public and private spending- were discussed. The study includes some discussion about pharmaceutical spending, health system capacity and use of medical services alongside health spending.

There are also some studies which are mainly interested in social-economic factors and lifestyle of community on efficiency or health system performances rather than the health resources. The objective of Afonso & St Aubyn (2006) is to show the relationship between health production and other factors. The article claims that health expenditure is one of the most important expense item for almost all countries. When they compared the expense rates between OECD countries and OECD average, they discovered a big diversification between the countries. However, different levels of health expenditure increases were observed for every country in spite of diversification of expense rates. Briefly, health expenditure shows augmentation globally. Besides, the researchers tried to evaluate the efficiency of health services between all selected countries. Input variables were collected into two groups: directly health related inputs and environmental factors. When calculation was made to see the efficiency of health services, output variables were assessed on all selected input variables separately according to the group they belonged to.

Different from these studies, Benneyan et al. (2008) which is another exception from many other previous studies, analyzed the healthcare systems’ benchmarking within process improvement and six sigma context. Process improvement and management decision making is common business practice for benchmarking. Six sigma is an approach which content of define, measure, analyze, improve, and control (DMAIC). For

instance, benchmarking of countries can create contributions about measurement, analysis and improvement activities. For that purpose, DEA was implemented on hospital level, national health system level and regional state level for benchmarking health care systems efficiency in this study. Benchmarking of national healthcare system is the part which is concerned with this study.

3.2.METHODOLOGY

Most of the papers that addressed OECD health performance used the non-parametric DEA methodology. Exceptions can be found in Greene (2003) that used Stochastic Frontier Analysis to analyze the WHO 2000 data set from 1993 to 1997.

As it can be seen in section 2 of this study there are several DEA models, which can be distinguished in terms of orientation (input and output oriented), in terms of returns to scale assumptions (CRS, VRS etc.) in terms of convexity assumptions (Free Disposal Hull (FDH), or convex DEA). There are also some studies that implemented Malmquist indices, second-stage Tobit models or bootstrapping procedures.

When the previous studies which implemented the DEA for measuring the efficiencies of countries health system performances are examined, some of them appears to be focusing on corporate efficiency while some of the others focus on system-wide macro level efficiency. (Evans , Tandon, Murray , & Lauer, 2001)

There are many researchers who used output-oriented DEA method when analyzing OECD health care efficiency. (e.g. (Alexander, Busch, & Stringer , 2003), (Benneyan , Sunnetci , & Ceylan , 2008), (Afonso & St Aubyn, 2006), (Hadad , Hadad , & Simon-Tuval , 2011), (Spinks & Hollingsworth, 2005)). Most of these studies also implemented other DEA methodologies which will be detailed below for measuring robustness or understanding effects of other factors. However, Puig-Junoy (1998) and Asandului et al. (2014) preferred to implement their research with input oriented DEA method.

Alexander et al. (2003) used a particular output-oriented DEA model and the purpose of choosing output-oriented method was to recognize potential of health outcome improvement of developing countries rather than recognizing the potential of savings of the health expenditures.

As it can be seen in section 2, BCC (variable returns to scale (VRS)) and CCR (constant returns to scale (CRS)) are the two different approaches for input and output oriented calculation system. Researchers generally prefer to choose one of these approaches. For instance, Spinks & Hollingsworth (2005) and Asandului et al (2014) preferred to use VRS type DEA model. However, sometimes, in some studies both VRS and CRS approaches were used. (For example, Mirmirani & Lippmann (2004)). The aim of this study was to separate input variables such as health resources and schooling for understanding the real effect of health resources on efficiency and to recognize the difference of schooling effect on efficiency level. Likewise, Puig-Junoy (1998) used also both VRS and CRS model for discovering relative health production performance of the countries. These countries were compared according to their relative technical efficiency.

Most of the studies used convex and traditional DEA models, but some studies also used econometric models. For example, Hadad et al. (2011) used linear regression methods to measure the relationship between health system efficiency (HSE) and social-economic, environmental factors. Similarly, Evans (2001) implemented the regression technique to evaluate relative efficiencies of national healthcare systems in 191 countries.

Many studies used Tobit analysis method and single and double bootstrap procedure in second-stage analysis part. For example, Alexander et al. (2003) implemented Tobit analyses in their study. DEA output oriented efficiency scores and variables related with countries' health system performance were included in the second-stage analysis part of the study and regression analysis were run. Likewise, Afonso & St Aubyn (2006) implemented their study with a two-stage DEA approach. In this study, both Tobit analysis, single bootstrap and double bootstrap procedures were implemented. Moreover, Afonso & St Aubyn (2006) used PCA (Principal Component Analysis) for collecting dispersed variables and aggregating them with each other. Moreover, semi parametric

procedure was implemented. Environmental variables were involved as control variables in the second part of the analysis for finding the efficiency of health services. Puig-Junoy (1998) also used a two-stage approach to find the differences between efficiency scores which depend on environmental factors and stochastic censored model. There are two important steps and some important features about the study of Puig-Junoy (1998). First of all, inefficiencies were calculated by using the DEA model and environmental variables were ignored. Secondly, environmental variables were included and the two-stage approach was implemented. Researchers created a constrained DEA model in order to find the optimal peer and weight structure for inefficient countries. According to this model, weight of physicians must not be lower than the weight of non-physicians. Likewise, weight of male life expectancy must not be higher or lower than weight of female life expectancy four consecutive times. Consequently, using different DEA efficiency scores average, overall, pure, and scale efficiency were calculated.

Furthermore, there are some studies which used Malmquist method. Grosskopf et al. (2006) used The Malmquist method as well as traditional DEA. This study had a difference from the other studies since the economic axiomatic index number theory and efficiency literature for describing multilateral health sector quantity index and panel-based improvement index were used. Likewise, Spinks & Hollingsworth (2005) performed a study which made use of the Malmquist approach for measuring technical efficiency of the countries. Besides, technical efficiency change, technological change and total factor productivity chance were measured with Malmquist approach in cross-country level.

Nonetheless, some studies show only comparison with the literature without any calculation approach like Andreson et al. (2003) and Varabyova & Müller (2015). Andreson et al. (2003) didn't use any calculation method. They directly obtained variables about health resources and social-economic situation of citizens from OECD database and created a comparison between the countries with using current literature and collecting variables. Likewise, Varabyova & Müller (2015) created a literature review study. They collected many different researches which are used DEA or SFA for measuring health system efficiency of OECD countries.

3.3.INPUTS AND OUTPUTS USED IN DEA BASED STUDIES

There is not much controversy regarding the outputs used in DEA based studies. These should proxy the health status of the population, and not many variables are able to quantitatively measure the health development of the country. As a result, the most frequently employed variables are life expectancy and infant mortality rate (note that some researchers prefer to use infant survival rate as outputs for creating a positive correlation with inputs). Examples of studies using these variables include, Spinks & Hollingsworth (2005), Alexander et al. (2003), Mirmirani & Lippmann (2004), Benneyan et al. (2008), Puig-Junoy (1998), Afonso & St Aubyn (2006), Asandului et al. (2014), Hadad et al. (2011), Grosskopf et al. (2006). Most of these studies did not use only one or two of these common output variables but also, employed many different kind of output variables, too. Using life expectancy variables as an average of female and male is a common approach while there are many researchers that preferred to separate this variable as male and female. In this dissertation, life expectancy variable were considered as an average of life expectancy at birth.

Another output that we can find in the literature is Disability adjusted life expectancy (DALE). (Note that this variable can be used as average or male and female) It is also one of the most common output variable used. Examples of the studies that used this variable include, Spinks & Hollingsworth (2005), Alexander et al. (2003). However, there are some very rare used variables such as non-adverse event rate, weighted combination of urban-to-rural under five mortality rate, upper-to-lower wealth quartile, none-to-lower wealth mother ratios, adult non-mortality, infant non-mortality and morbidity surrogate but they were used by Benneyan et al. (2008). In this study, input variables show diversification and difference according to purpose and economic references which are micro level or macro level. Furthermore, with same logic of using infant survival rate rather than the infant mortality rate, Afonso & St. Aubyn (2006) used potential years of life not lost variable as an output rather than potential years of life lost. Health adjusted life expectancy which can estimate mortality and morbidity variation of population was used by Asandului et al. (2014). The reciprocal of the under-five mortality and real GDP per capita variables were also rare output measurements in the literature used by Grosskopf et al. (2006)

Regarding the inputs, there are many different specifications in the literature. In general, inputs can be grouped into several categories. One of the most effective study for understanding how input variables should be grouped is Varabyova & Müller's study in the literature in 2015. Researchers grouped the input variables based on their relation to health resources, socio-economic factors and lifestyle factors.

In the view of this classification and also all previous literature, we preferred to group the input data according to their attributes. These are 'population habits and life quality', 'external conditions of the country', 'resources' and 'expenditures and finance'.

In Figure 7, we show the variables that have been used the most within each of these groups.

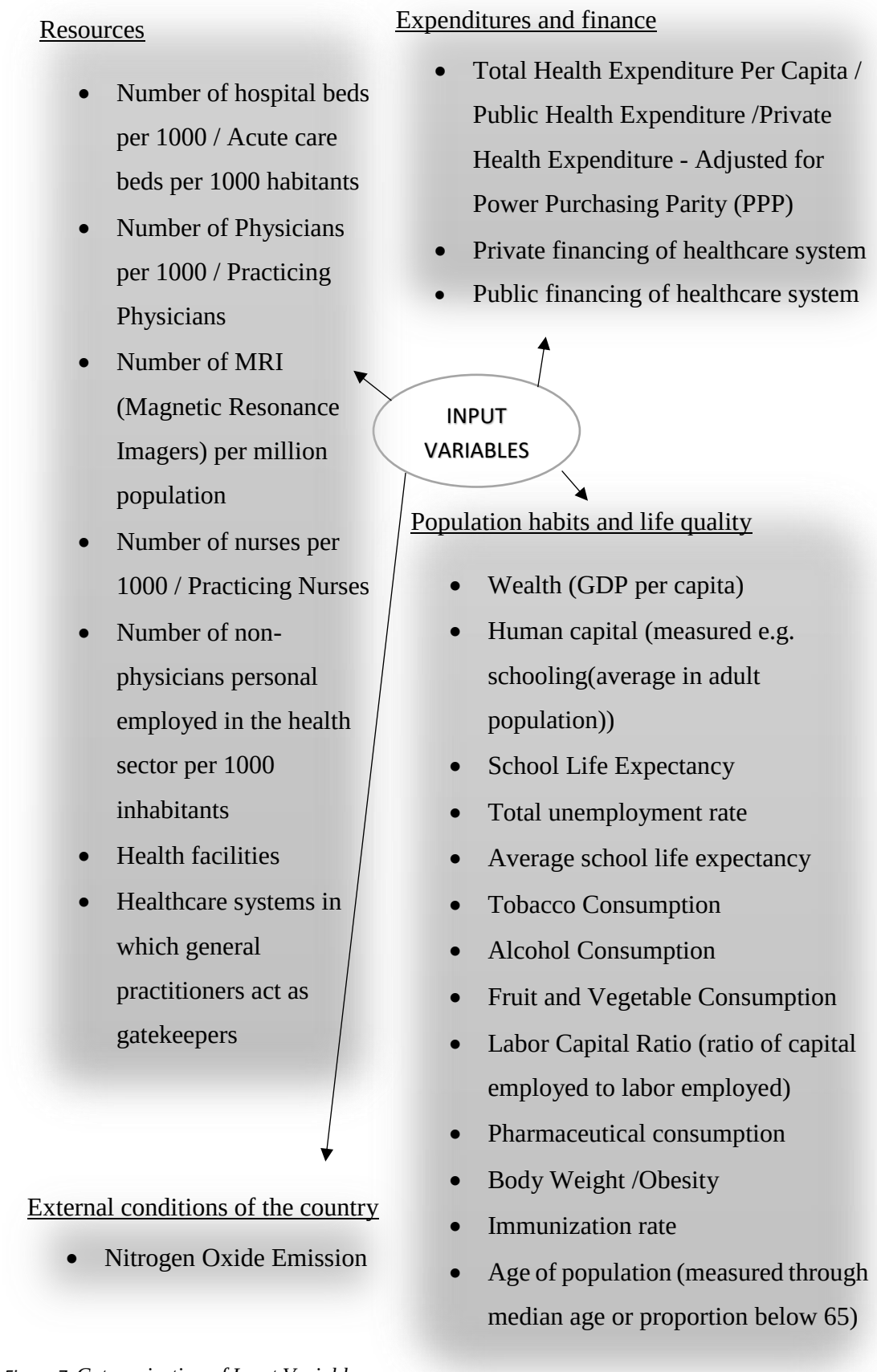


Figure 7. Categorization of Input Variable

3.4.DATA SETS AND TIME ISSUES

This part of the study includes some definitions concerning data sets and time issues of the previous researches.

There are many studies that implemented the DEA analysis on OECD countries. However, some of these countries were eliminated by many of the previous researches due to the data availability (e.g. (Spinks & Hollingsworth, 2005) (Puig-Junoy , 1998), (Afonso & St Aubyn, 2006)) or low GDP per capita level (e.g. (Hadad , Hadad , & Simon-Tuval , 2011)). Also, some studies can be found where they used G12, EU countries or much bigger sample size like 50, 180 or 190 different countries (e.g. (Alexander, Busch, & Stringer , 2003), (Mirmirani & Lippmann , 2004), (Asandului , Roman , & Fatulescu , 2014), (Grosskopf , Self , & Zaim , 2006)). The data were generally taken from OECD or WHO data set. The most common internet resources are used for finding the missing data.

Time issues are related to the panel data which are reachable easily by authors. Most of the current studies prefer to do analyses for more than one year. This time issue is directly related with data availability and to the method used. Most of the studies implemented methods such as Malmquist, Tobit or bootstrapping etc. The study of Spinks & Hollingsworth (2005) implemented two different data set which were OECD and WHO and the time periods chosen were 1995 and 2000 for OECD data set while 1993 and 1997 for WHO data set. They used a Malmquist index for dealing with time issues, analyzing efficiency change and technological change over two periods (1995 to 2000 and 1993 to 1997). Alexander et al. (2003) used 1998 and 1999 variables separately for examining the efficiency of health outcomes from health expenditures, by using output-oriented DEA model and second stage Tobit analysis. Mirmirani & Lippmann (2004) used 1991 to 1995 data, and reported results for each of these years separately. However, they do not specify, whether a year-specific frontier was used or whether a pooled frontier was used for the 3 years of analysis. Puig-Junoy (1998) chose the decades of 1960s 1970s, and 1980s for the DEA analysis (averages for the decade were used). However, for the second-stage analysis, variables were taken only from 1980.

All of the data refer to 2007 for study of Hadad et al. (2011) for first and second stage analysis. A relationship were found between environmental variables, health resources and health system efficiency. Likewise, all data refer to 2010 for the study of Asandului et al. (2014) to discover efficiency of selected countries with input-oriented DEA model. The study of Afonso & St Aubyn (2006) used average of 2000 and 2003 for output oriented DEA, Tobit and bootstrapping analysis.

Grosskopf et al. (2006) used two different indexes which are health quantity index and health productivity or improvement index in order to be able to find and to represent efficiency and productivity levels of the countries. For health quantity index, data refer to 1997 and sample size was huge. 193 countries were selected and separated according to their income levels as 66 middle income, 84 low income and 28 developed countries. For health productivity or improvement index, 1977-1980, 1980-1982, 1982-1987, and 1987-1990 time periods were used due to the data availability and sample size was quite narrower this time. 27 developed, 19 middle income and 9 low income countries were chosen.

3.5.CONCLUSIONS OF THE PREVIOUS STUDIES

The conclusions of the above mentioned studies show a diversity according to sample size used. In general, health resources have a direct effect on the efficiency level. Evans et al. (2001) shows that additional resources improve public health systems and provide better efficiency levels. Moreover, according to the findings, countries should protect their health care resources. Especially for reducing infant mortality rate (IMR), countries should give access to immunization for children ((Alexander, Busch, & Stringer , 2003), (Hadad , Hadad , & Simon-Tuval , 2011)). However, previous studies could not measure a significant relationship between environmental factors and health care efficiency level of countries. (Hadad , Hadad , & Simon-Tuval , 2011) Nonetheless, the only effective environmental factor found is education that provides continuity to health resources. (Alexander, Busch, & Stringer , 2003)

Health expenditure and health financing is also one of the most commonly used indicator. If the expenditure level is too low, the system is not working appropriately. (Alexander, Busch, & Stringer , 2003). Grosskopf et al. (2006) proved that developed and middle income countries' health care financing are more than less developed countries in public sector financing area. Besides, there is not a big difference between high and middle income countries efficiency level. (Asandului , Roman , & Fatulescu , 2014) However, there are also different kinds of indicators to reach better health measurements, thus higher health expenditure rates are not the only dimension for countries. (Grosskopf , Self , & Zaim , 2006) Thus, all countries should formulate health policies to create higher efficiency level according to their countries' economic, cultural or social situations separately. (Alexander, Busch, & Stringer , 2003)

One other the most encountered result of the previous studies is about US efficiency level. All studies included US as one of the decision making unit. It was found that US health financing expenses are higher than all the other countries although health system performance level is always lower. This situation causes constantly increasing healthcare prices in US. (Anderson et al. (2003) Mirmirani & Lippmann (2004))

Health system policies are also one of the most important issues for obtaining a good efficiency level. According to Marmor & Wendt (2012) health inequalities might be changed by political factors. Moreover, when health policy decisions are being made, a strong relationship between healthcare actors and healthcare systems might be observed.

There are some research which reanalyzed the WHO 2000 report due to the criticism of the report. The report is criticized in a lot of ways such as efficiency, objectivity, data etc.. Gravelle et al. (2003) found lack of robustness in WHO 2000 report.

Consequently, healthcare is one of the determinants of the health systems within the social, economic and political context of the OECD countries. Moreover, there are some factors which affect the health outcomes more than healthcare system and provides to understand the coverage of healthcare. These are safety, cost effectiveness, governance, patient satisfaction, accessibility etc. (Arah , Westert, Hurst , & Klazinga , 2006).

4. EMPIRICAL ANALYSIS

In the light of all previous information and literature review, input and output variables, sources of data, years of analysis, treatment of missing data will be explained in this section.

4.1.DATA AND SAMPLE

The main purpose of the study is to understand the effect of different health system models on healthcare system performances. As mentioned in the first part of the study, all main health system models (Beveridge, Bismarck, National Health Insurance and Out-Of-Pocket) have different financial attributes. One of them is based on insurance while the other one is based on public health expenditures and taxes. According to the resources of health expenditures and financing differences of health system models, it will be tried to find diversities between the OECD countries' health system performance levels. According to the efficiency results that will be found, health system performance interpretation will be done and better health system model will be determined.

The most common outputs in the literature is life expectancy and infant mortality rate as mentioned above. Following the same logic, life expectancy and infant mortality rate will be used as output variables in this study. However, infant mortality rate will be derived as an infant survival rate to create positive correlation with input variables. In addition, because of the similarity between female and male life expectancy variables between selected years, average life expectancy is chosen.

As noted above, understanding financial differences on health outcomes is one of the most important points to create logical results. Thus, public health expenditure rate and private health expenditure rate are selected as input variables. Moreover, to understand the welfare of citizens, GDP Per Capita is also selected as the other input variable. If there are any differences between OECD countries' health care system performances, the effect of welfare indicator on these differences will be determined. With similar logic, number of physicians (per 1000) is selected as the last input data to determine the effect of health care resources on outcomes.

Except GDP per capita, all input and output data were derived from OECD health statistics for 2015. GDP Per Capita variables were derived from the World Bank, International Comparison Program database. However, input variables had much more missing data in comparison with output data. Thus, some of the missing data of inputs were completed from the World Data Bank. After this completion, if there were still missing values between the years, the average of two cover years was taken and a middle value was created. Furthermore, if last one or two years' data were missing, the nearest year's value was used. Health resource variables and life quality indicators had more missing data than the financing variables.

	Variable	Description
Input	Private health expenditure, per capita, US$ PPP	Privately funded part of total health expenditure. Private sources of funds include out-of-pocket payments (both over-the-counter and cost-sharing), private insurance programs, charities and occupational health care.
	Public health expenditure, per capita, US$ PPP	Health expenditure incurred by public funds. Public funds are state, regional and local Government bodies and social security schemes. Public capital formation on health includes publicly financed investment in health facilities plus capital transfers to the private sector for hospital construction and equipment.

	GDP per capita, PPP (US $)	GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.
	Physicians, Density per 1000 population (head counts)	Persons who have completed studies in medicine at university level (granted by adequate diploma) and who are licensed to practice.
Output	Life Expectancy	Life expectancy at birth and at ages 40, 60, 65 and 80. It is the average number of years that a person at the age can be expected to live, assuming that age-specific mortality levels remain constant.
	Infant Survival Rate	Infant Mortality Rate is the number of deaths of children aged under one year of age that occurred in a given year, expressed per 1000 live births. Infant survival rate is just a mathematical transformation of infant mortality rate.

Table 3. Description of selected input and output variables. (Source: OECD Statistic, World Data Bank)

Data on the above variables from 2000 to 2014 were used in this thesis.

4.2.DESCRIPTIVE STATISTICS

Before the implementation of DEA analysis system, to evaluate the general frame of variables and to recognize the relationships of variables with each other, linear regression analysis was implemented. When statistical analyses were made and descriptive frame was created, countries and health systems were all considered jointly.

In the first case, input variables were considered as independent variables and selected output variables were considered as dependent variables. The data from all years of analysis were merged into a single data set. To consider the general frame of the variables and the relationship of data with each other, linear regression analysis was implemented. Before the linear regression analysis, correlation tables, custom tables and statistical tables were created and presented.

Descriptive custom tables can be in Table 4. Mean values of all OECD countries were calculated and collected according to health system models and years to see the general frame.

IBM SPSS 23 was used to create all descriptive analysis part tables and plots. In addition, R studio was used for DEA analysis part.

Table 4 shows maximum, minimum, mean and standard deviation values of input and output variables according to health system models and at the same time it is possible to observe same values in overall from this table. Total observation number is 510 for 34 countries and 15 selected years as can be seen in Table 4.

Moreover, it is possible to observe all OECD countries and their health system models in the appendix part of the study.

		Private Health Expedinture US$ PPP					Public health Expenditure US$ PPP					GDP per Capita, PPP (US$)				
		Max	Min	Mean	Std. Deviation	Coefficient of Variation	Max	Min	Mean	Std. Deviation	Coefficient of Variation	Max	Min	Mean	Std. Deviation	Coefficient of Variation
	Overall Sample (510 observations)	5261,00	219,00	2003,73	1050,59	0,52	4653,00	64,00	750,51	654,03	0,87	98459,52	8749,15	32266,71	13567,78	0,42
System	Beveridge (210 Observation)	5261,00	852,00	2249,17	816,92	0,36	1251,00	266,00	661,50	203,96	0,31	66766,42	17847,37	34168,53	9089,19	0,27
	Bismarck (195 Observation)	4586,00	386,00	1978,48	1058,34	0,53	1172,00	64,00	580,27	267,23	0,46	98459,52	9706,93	32325,60	16303,38	50,00
	National Health Insurance (60 Observation)	3132,00	219,00	1064,05	913,67	0,86	1297,00	126,00	589,20	367,49	0,62	45065,69	8749,15	22738,15	10911,59	0,48
	Out-of-Pocket(45 Observation)	4267,00	280,00	2220,62	1413,42	0,64	4653,00	292,00	2118,71	1462,36	0,69	59539,78	9848,90	35841,08	15854,52	0,44
		Physicians, Density per 1000 population					Life Expectancy					Infant Survival Rate				
		Max	Min	Mean	Std. Deviation	Coefficient of Variation	Max	Min	Mean	Std. Deviation	Coefficient of Variation	Max	Min	Mean	Std. Deviation	Coefficient of Variation
	Overall Sample (510 observations)	6,29	,90	3,01	,90	,30	83,67	70,90	78,98	2,72	0,03	0,998	0,960	0,990	0,005	0,000
System	Beveridge (210 Observation)	6,29	1,96	3,34	,87	0,26	83,20	76,10	80,12	1,50	0,02	0,998	0,992	1,000	0,001	0,000
	Bismarck (195 Observation)	4,99	1,93	3,12	,62	0,20	83,67	70,90	78,34	3,06	0,04	0,998	0,988	0,990	0,002	0,000
	National Health Insurance (60 Observation)	2,55	1,26	1,86	,35	0,19	82,24	71,10	76,87	3,38	0,04	0,996	0,960	0,990	0,010	0,010
	Out-of-Pocket(45 Observation)	4,40	,90	2,48	1,10	0,44	82,90	76,70	79,22	2,06	0,03	0,996	0,989	0,990	0,002	0,000

Table 4. Maximum, minimum, mean and standard deviation values of input and output variables according to health system models and overall.

When observed values are too far from the mean values, standard deviation values tend to be higher. Moreover, higher std. deviation values decrease reliability of observations. In the light of these explanations, as seen in Table 4, it can be observed that overall standard deviation values of Private health expenditure, Public health expenditure and GDP per capita are quite high. This means the difference between observation values is on average very high. Furthermore, coefficient of variations (standard deviation/mean) can be observed from the table for all input and output variables. This value shows the coverage ratio of mean values on std. deviation values. According to these ratios, it can be said that there is a huge variation in terms of inputs and a very small variation in terms of outputs.

When the maximum, minimum and standard deviation values, which were calculated for each health system model, are checked, it is possible to mention that Bismarck and Out-of-Pocket systems' standard deviation values are higher for Private health expenditure. Likewise, standard deviation values of Public Health Expenditure are higher for the Out-of-Pocket model than the other health system models. GDP per capita also has very high standard deviation values for all health system models. These high standard deviation values refer to a huge heterogeneity between countries that belong to a specific health system model.

The meaning of the mean value depends on the number of countries involved in the selected health system model and development level of these countries. Although Out-of-Pocket involves only three countries -Chile, Switzerland, and the US- average values for almost all input indicators are higher. The reason of this situation is that two of these three are highly developed countries. According to the definition of the health system models, Beveridge model's mean value on private health expenditure is surprisingly high because this system is a tax based system. Likewise, Out-of-Pocket system's mean value of public health expenditure has the highest value while Out-of-Pocket system is directly based on private financing to provide health services to the citizens.

That kind of surprising results can be observed in Table 4. As mentioned in the first part of the study, the differences of health system models is based on their financing method.

As is known, tax based, private based or mix systems exist. However, it should be added at this point that, to finance every health system's requirements and to provide health services to all citizens as much as possible, governments should benefit from all possible resources. However, the usage level of these resources is what determines the health system model of a country. Of course, countries make their health system models' choices according to their policies, but an important issue is that even if the countries' choices show opposite policies, every country benefits from private and public health financing resources even at a very limited ratio. This situation explains the meaning of mean values of all input and output variables according to health system models. Moreover, the development level of countries has an effect on these calculated mean values.

Table 5 shows maximum and minimum values for all selected input and output variables according to all selected years. One thing that is possible to see in this table is that all input and output variables show an increasing trend over time. Technological changes, increasing development level of countries, reforms on health services and systems, innovations might be considered as the reasons of these improvements. Only GDP per capita decreases in 2009 and afterwards the increase continues during the following period for this indicator.

		Private Health Expedinture US$ PPP		Public health Expenditure US$ PPP		GDP per Capita, PPP (US$)		Physicians, Density per 1000 population		Life Expectancy		Infant Survival Rate	
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Year	2000	2317,0	219,0	2908,0	64,0	56593,4	9320,9	4,3	0,9	81,2	71,0	0,996	0,96
	2001	2509,0	232,0	3127,0	71,0	56234,1	8749,2	4,4	0,9	81,5	70,9	0,996	0,963
	2002	2816,0	238,0	3350,0	80,0	59409,5	8784,5	4,6	0,9	81,8	71,4	0,996	0,966
	2003	2990,0	267,0	3535,0	93,0	60927,0	8915,7	4,7	0,9	81,8	71,8	0,997	0,968
	2004	3165,0	298,0	3706,0	140,0	65447,6	10278,9	4,9	1,0	82,1	72,4	0,997	0,97
	2005	3346,0	307,0	3899,0	179,0	67081,1	11512,5	5,0	1,0	82,0	72,9	0,997	0,972
	2006	3610,0	331,0	4029,0	206,0	77301,0	13026,4	5,4	1,0	82,4	73,1	0,997	0,974
	2007	3832,0	360,0	4120,0	239,0	82846,2	13712,9	5,6	1,0	82,6	73,2	0,997	0,976
	2008	4184,0	389,0	4192,0	226,0	85015,6	14272,2	6,1	1,0	82,7	73,9	0,997	0,978
	2009	4303,0	415,0	4235,0	164,0	80306,1	13909,6	6,2	1,0	83,0	74,0	0,998	0,979
	2010	4435,0	443,0	4338,0	187,0	84589,8	14586,5	6,2	1,4	82,9	74,1	0,998	0,981
	2011	4656,0	483,0	4509,0	185,0	91073,3	15729,6	6,3	1,6	82,8	74,2	0,998	0,982
	2012	4935,0	514,0	4653,0	185,0	90788,3	16260,8	6,3	1,7	83,2	74,4	0,998	0,984
	2013	4981,0	536,0	4516,0	204,0	95928,6	16209,4	6,3	1,8	83,4	74,6	0,998	0,985
	2014	5261,0	536,0	4516,0	204,0	98459,5	17314,7	6,3	1,8	83,7	75,2	0,998	0,986

Table 5. Maximum and Minimum values of all input and output variables according to selected years.

Correlation table and plot tables can be observed at below. All correlations between the input and output variables are generated as a numeric and a visual in Table 6 and Figure 8, respectively.

Correlations

		Private Health Expenditure	Public Health Expenditure	GDP per Capita	Number Of Physician	Life Expectancy	Infant Survival Rate
Private Health Expenditure	Pearson Correlation	1	,455**	,865**	,401**	,687**	,532**
Public Health Expenditure	Pearson Correlation	,455**	1	,417**	.085	,265**	,144**
GDP per Capita	Pearson Correlation	,865**	,417**	1	,281**	,633**	,523**
Number Of Physician	Pearson Correlation	,401**	.085	,281**	1	,377**	,453**
Life Expectancy	Pearson Correlation	,687**	,265**	,633**	,377**	1	,676**
Infant Survival Rate	Pearson Correlation	,532**	,144**	,523**	,453**	,676**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6. Correlation table of input and output variables regardless of health system model difference.

As can be seen in Table 6, there is a linear correlation between almost all input and output variables. The only exception can be observed between the number of physicians and public health expenditure, where the correlation is not statistically significant. A strong correlation exists between variables. However, weak correlations can also be observed for some variables. For example, GDP per capita has a strong relationship with all other independent and dependent variables. However, number of physicians and public health expenditure's correlation values are generally lower than for all other variables.

When looked at the general frame for dependent variables, it can be seen that correlation levels of infant survival rate show lower values than life expectancy with same independent variables. The only exception is the number of physicians. Infant survival rate has a stronger correlation with the number of physicians than life expectancy.

However, correlation coefficients table only shows linear relationships between independent and dependent variables. To diagnose any non-linear relationship between them, the charts below were created.

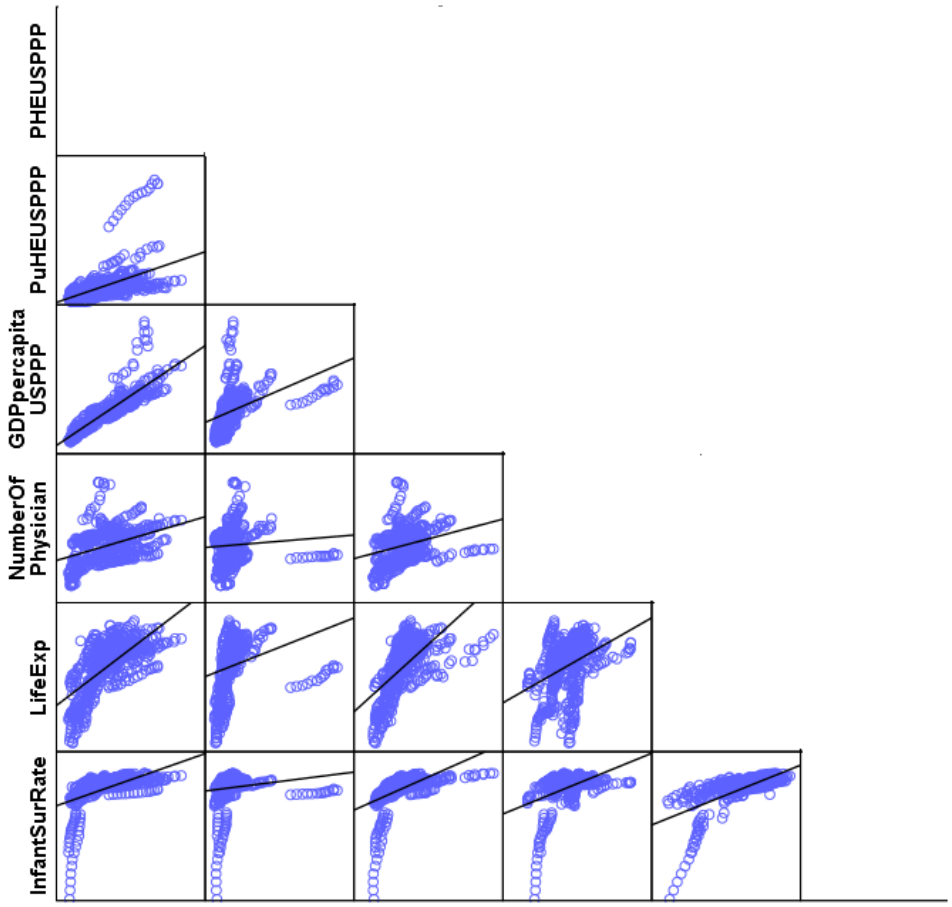


*Figure 8.*Correlation chart of all input and output variable

According to Figure 8, some non-linear relationships can be observed. Only life expectancy and infant survival rate have an approximately linear relationship with private health expenditure. However, it can be seen clearly that there are some countries breaking the index to reach the strong linearity.

After these descriptive analyses, to understand the relationship between health system models, year and outputs, the strength of their effect on each other is measured with multiple linear regression analysis. Life expectancy and Infant Survival Rate are regressed on year and health system models. To measure the effect of health system

models, dummy variables were used, because numeric variables are necessary to understand the relationship and effect of health system models.

Linear regression model was run without making any transformation on independent variables. Dummy variables that were created to see the effect of health system models and year were also included into the regression model as independent variables.

Model Summary[b]										
	Life Expectancy					Infant Survival Rate				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,575[a]	,330	,325	2,23570	1,655	,654[a]	,427	,423	,0035027	2,072
a. Predictors: (Constant), Year, OOP, NHI, Bismarck										

Table 7. Model Summary table of Linear Regression Analysis.

According to Table 7, R square value is around 33% for life expectancy and 43% for infant survival rate. This means that the selected variables explain 33% of the variation in life expectancy and 43% of the variation in infant survival rate, around the respective means. R square values are not so high, but the analysis which was implemented, higher R square values do not a necessity.

Table 8 shows the coefficients of the independent variables. The constant represents the expected value of the dependent variable when all independent variables are zero.

Coefficients[a]											
		Life Expectancy					Infant Survival Rate				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta			B	Std. Error	Beta		
1	(Constant)	78,074	,240		325,863	0,000	,993	,000		2646,492	0,000
	Bismarck	-1,784	,222	-,319	-8,025	,000	-,001	,000	-,094	-2,559	,011
	National Health Insurance	-3,248	,327	-,385	-9,924	,000	-,009	,001	-,635	-17,709	,000
	Out-of-Pocket	-,897	,367	-,094	-2,442	,015	-,003	,001	-,163	-4,591	,000
	Year	,256	,023	,406	11,164	,000	,000	,000	,233	6,907	,000

Table 8. Coefficients of dependent variables with independent variables

The effect of health system models on output variables is one of the most important issues for this research. Health system models are identified in the model as a dummy variable. Beveridge model is taken as the base case. In this case, it can be said that on average, countries following the Bismarck type health model rather than the Beveridge show 1,784 years less on life expectancy, when everything else is the same. Likewise, on average, countries following the National Health Insurance and Out-of-Pocket type health models rather than Beveridge show 3,248 and 0,897 years less on life expectancy respectively. For infant survival rate, all health system models counted to the linear regression analysis have very small difference rather than Beveridge. Bismarck, National Health Insurance and Out-of-Pocket models show 0,001, 0,009, and 0,003 percentage points less on infant survival rate than Beveridge system member countries, respectively. All these interpretations are valid when everything else is the same. So, it can be said that health system difference is very limited and small for infant survival rate.

Furthermore, t-values show the significances of the relationship between dependent and independent variables. All independent variables are statistically significant for life expectancy and infant survival rate. Year has a positive effect on life expectancy. This means that on average over the period of analysis life expectancy increased about 0,256 years over time while year has almost no effect for infant survival rate.

In addition to all these findings, understanding the relationship between welfare of countries and health resources is also an important point to create an adequate frame. Likewise, discovering the connection between health expenditures and health resources is another important point to see and understand the effects of these indicators with each other. This analysis will provide an important description for the conclusion part of the study. The main point is to try to understand whether having more health resources is an indicator of higher health expenditures and higher life quality level or not. If there are any statistically significant relationships between them, that will be recognized.

Below charts were created to see the direct relationship between selected variables. Partial regression plots were used for this purpose. This approach enables us to see the direct relationship of selected variables with each other without any other effect. In other words,

partial regression analysis is an approach that reveals the relationship between selected independent and dependent variables with the assumption that other independent variables are constant. Thus, the effect of other independent variables can be eliminated from the model. Hence, the direct effect of selected independent variables on the dependent variable can be recognized.

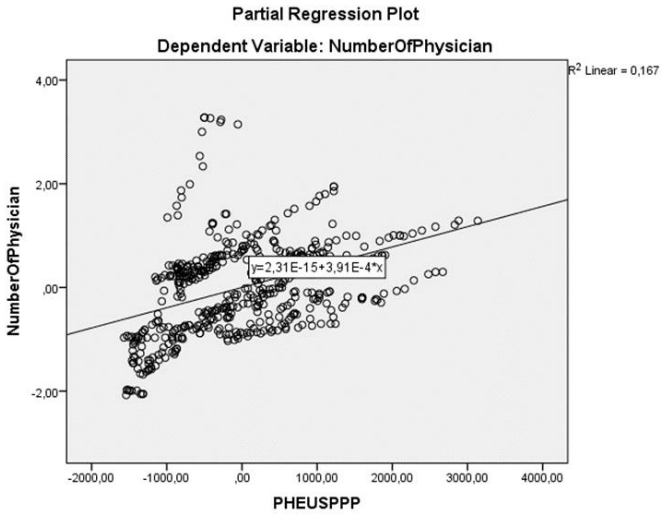


Figure 9. Relationship between Private Health Expenditure and Number of Physicians

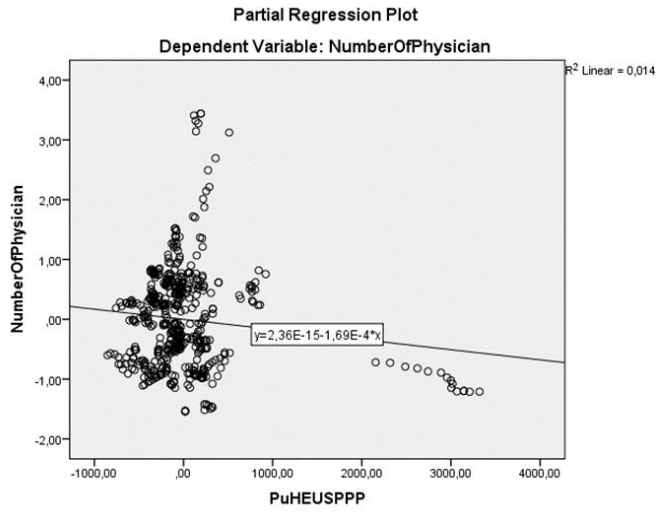


Figure 10. Relationship between Public Health Expenditure and Number of Physicians

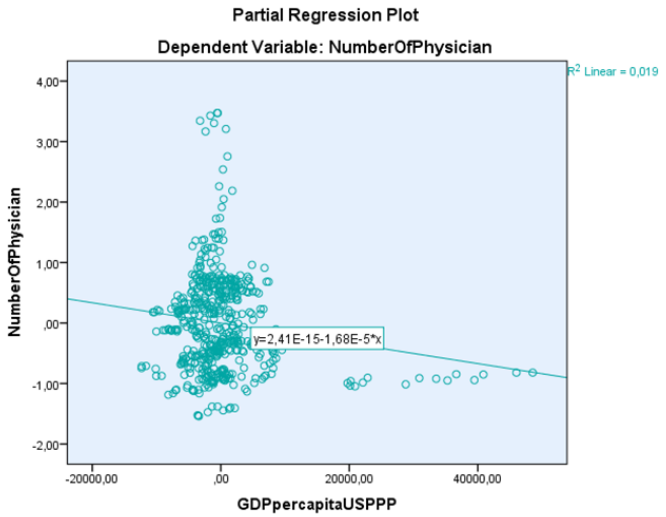


Figure 11. Relationship between GDP per Capita and Number of Physician

Figure 9, 10, and 10 were created to show the relationship between health resources and health financing indicators. A relationship close to linearity can be observed between private health expenditure and health resource indicator. Moreover, a positive relationship can be observed only in Figure 9. However, there is a negative relationship between public health expenditure, GDP per capita and number of physicians, as can be seen in Figure 10 and 11. The reason of these negative relationships is countries' very high expenditure rates. Otherwise it would be strongly positive. So, it can be said that higher health resources could be an indicator of higher private health expenditure while an interpretation cannot be made in the same direction for GDP per capita and public health expenditure.

4.3.DATA ENVELOPMENT ANALYSIS

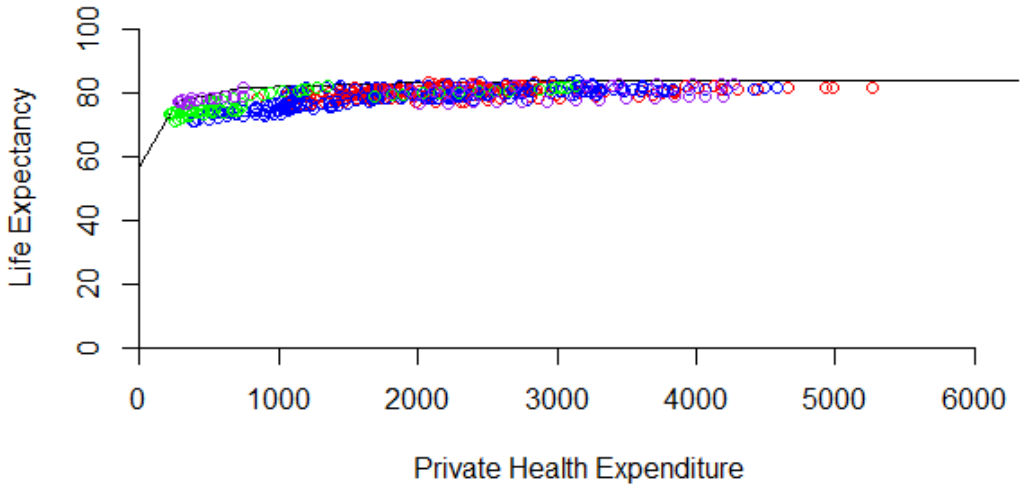
In this part of the study, DEA was implemented on variables to measure the efficiency score of countries and to propose solutions for increasing the efficiency values of inefficient countries' health system performances. In first case, VRS output-oriented method was implemented on variables. Each input against each output were plotted to have a feeling of the frontiers.

As can be observed from following graphs, output inefficiencies are very small, i.e. units are close to the frontier in terms of outputs but input inefficiencies are large – so input oriented model was decided to follow in order to better reflect the input inefficiencies and waste of resources.

Moreover, different healthcare systems were shown in different colors. These are: red-Beveridge, blue-Bismarck, green-National Health Insurance and purple-Out of Pocket. To see the efficiency difference of health system models clearly colorization were implemented.

As mentioned above, below graphs show observed inputs and outputs all countries without any restriction about year or system. Moreover, countries which are member of different kind of health system can be followed with the colors. All graphs are created according to all possible input and output combination separately and respectively.

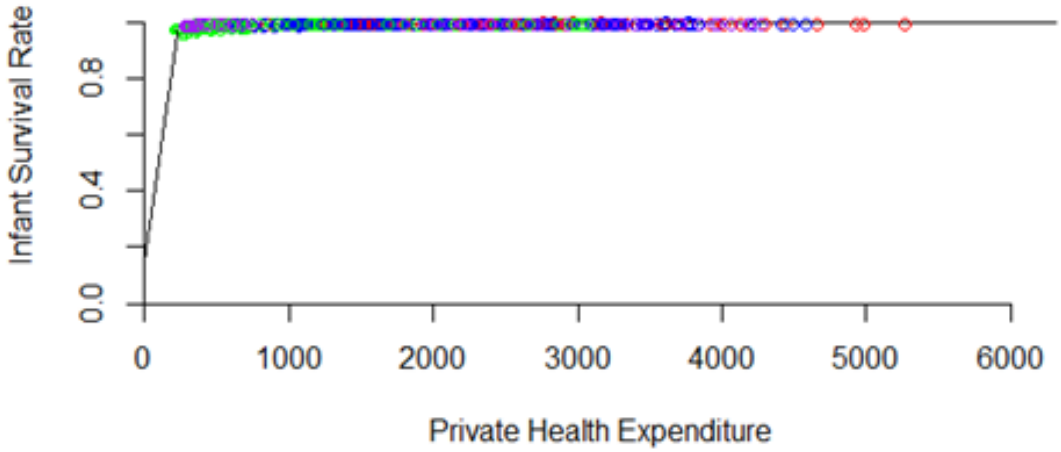
Graph 1 shows the effect of private health expenditure rate on life expectancy.



Graph 1. Efficiency frontier between Private Health expenditure and Life Expectancy

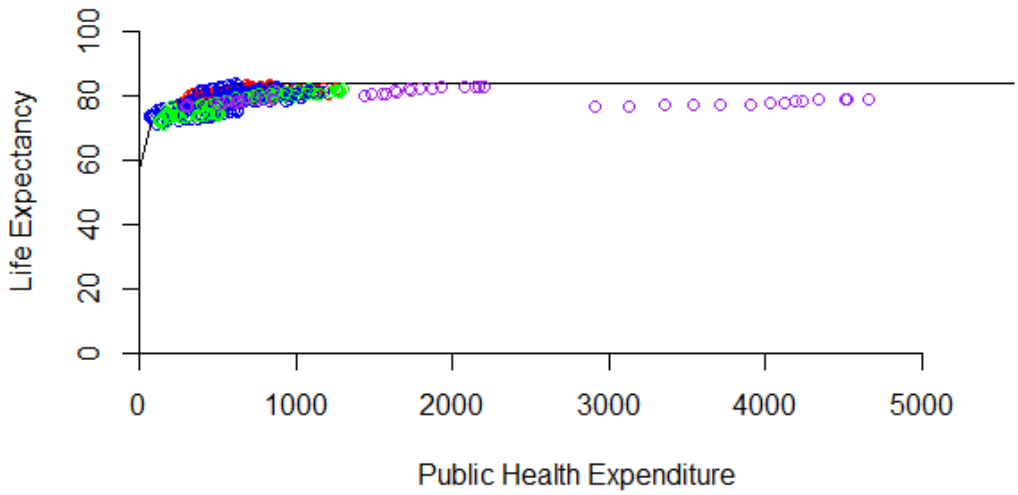
As can be observed from plots of Graph 1, all countries have similar life expectancy values while private health expenditure rates show increase according to health system model used in time. Member countries of Beveridge (in red) and Bismarck (in blue) model tend to have higher private health expenditure ratio than the other systems' member countries. Consequently, life expectancy levels show strong similarity for all countries although some countries have higher private expenditure rates.

Graph 2 shows the effect of private health expenditure on infant survival rate. Having looked at the graph, efficiency level of all selected countries is almost same. Only inferences can be made from the below graph is that some Beveridge, Bismarck, and Out-of-Pocket (in purple) countries have higher private health expenditure rates than the other. However, all countries have almost the same level of infant survival rate.



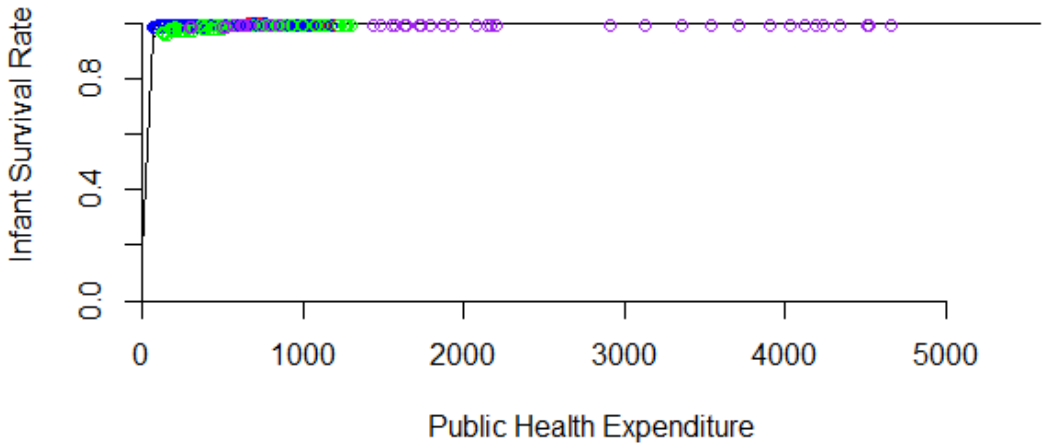
Graph 2.Efficiency frontier between Private Health expenditure and Infant Survival Rate

Following graphs show the effect of public health expenditure rate on life expectancy and infant survival rate, respectively. Unlike above graphs, one member country which is US - it can be easily distinguished if observation values checked- of Out-of-Pocket system gives more importance to the public health expenditure than all the other countries. However, it should be mentioned that life expectancy rates are found again so similar between countries. In other words, clear inefficiencies can be observed from Graph 3 for Out-of-Pocket countries with the ratio of public health expenditure according to life expectancy level possessed. Moreover, increasing rates can be observed for all selected countries on life expectancy over time.



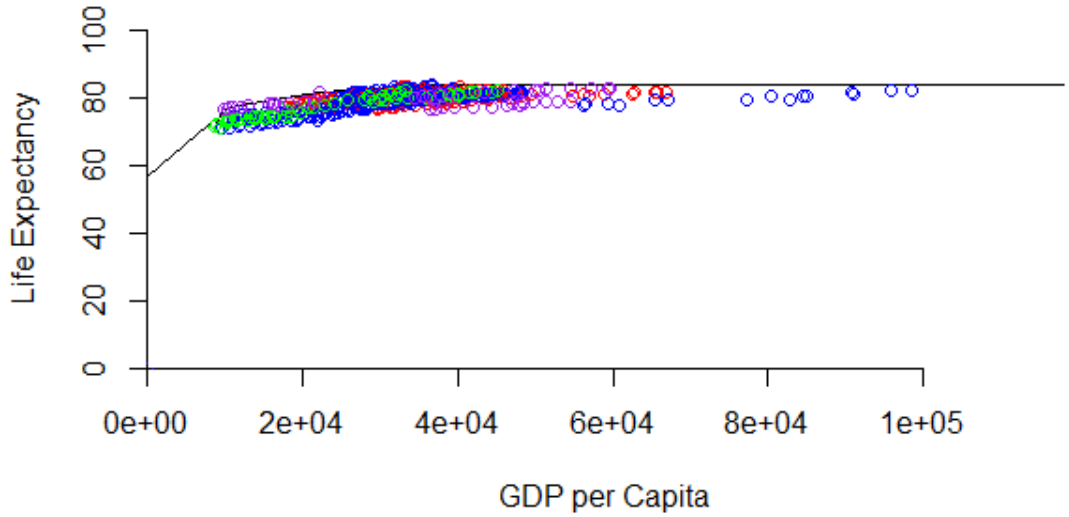
Graph 3. Efficiency frontier between Public Health expenditure and Life Expectancy

Likewise, the effect of public health expenditure on infant survival rate does not include any particular difference between the countries. Higher public health expenditure rates of Out-of-Pocket system' countries do not create any particular progress on the efficiency scores again.



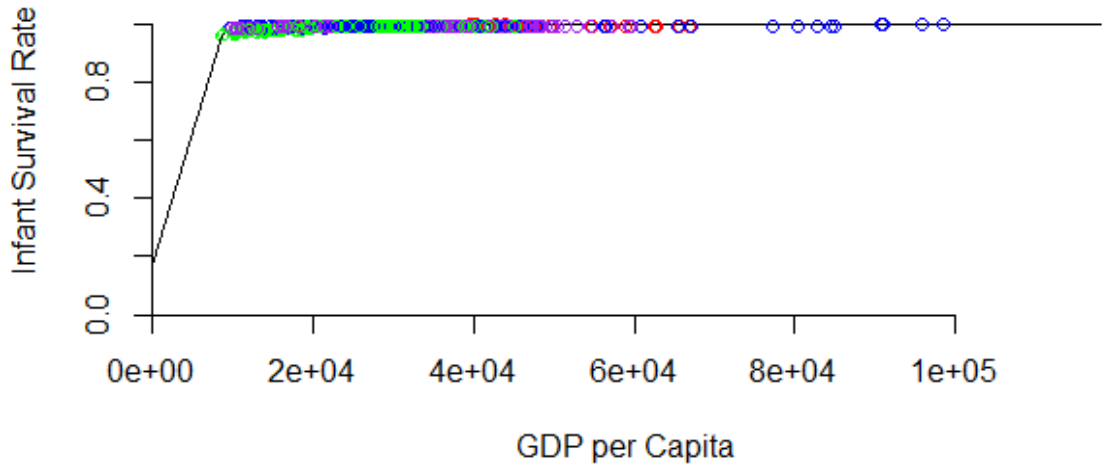
Graph 4. Efficiency frontier between Public Health expenditure and Infant Survival Rate

Graph 5 and 6 show the effect of GDP per capita on life expectancy and infant survival rate. According to Graph 5, Bismarck health system model' member countries have higher GDP per capita. However, National Health System Insurance Model (in green) countries' GDP per capita levels are lower in general when compared with the other systems' member countries. This time, the countries which have higher GDP per Capita rates also tend to have higher life expectancy rates. So, countries with higher GDP per capita have also potential to improve life expectancy.



Graph 5. Efficiency frontier between GDP per capita and Life Expectancy

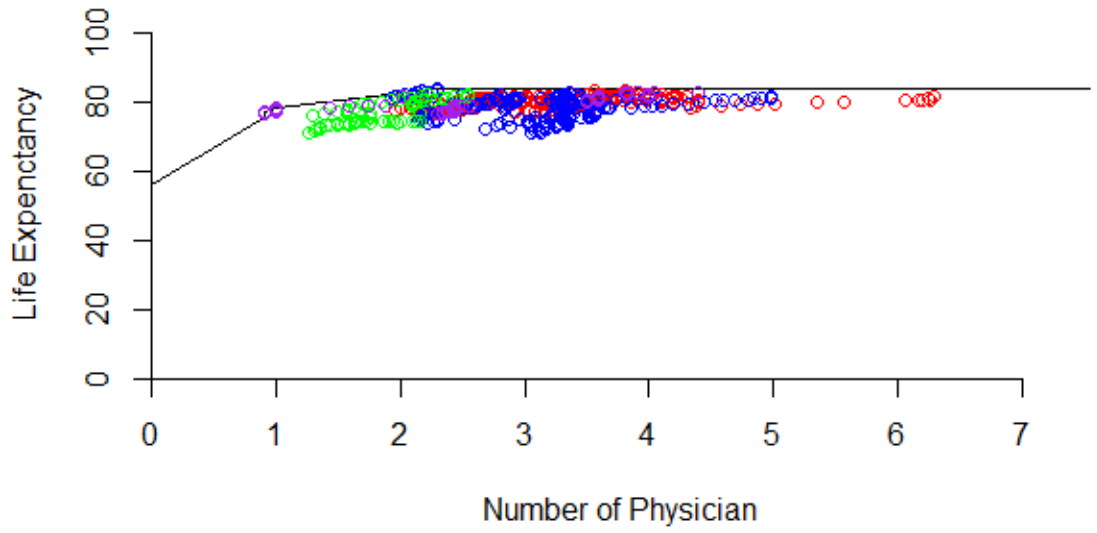
On the contrary of Graph 5, there is no particular difference between countries' infant survival rates in Graph 6. Infant Survival Rates of countries are found so similar regardless of higher or lower expenditure difference.



Graph 6. Efficiency frontier between GDP per capita and Infant Survival Rate

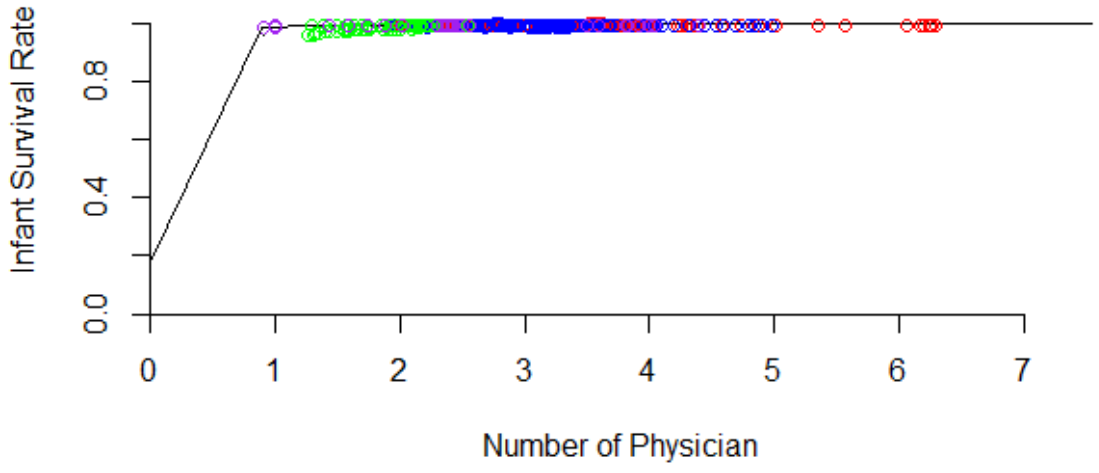
Next graphs were created to see Number of Physicians' effect on life expectancy and infant survival rate. Number of physicians' ratio shows condensation between the 2 and 4. According to Graph 7, some Beveridge countries have higher Number of Physicians' ratio than other systems' countries. The point is that, even if a country has low Number of Physicians rate, it could be efficient. Example of this explanation can be observed from

Out-of-Pocket system countries' (plotted in purple), where some observations on frontier can be observed. Moreover, it also can be seen from the below graph, some member countries of Bismarck and National Health Insurance models have lower life expectancy rates.



Graph 7. Efficiency frontier between Number of Physicians and Life Expectancy

Graph 8 shows the effect of number of physicians on infant survival rate. It can easily be observed that there is a strong similarity of infant survival rates regardless of number of physicians' ratio difference. All countries have almost same level of output.



Graph 8. Efficiency frontier between Number of Physicians and Infant Survival Rate

4.3.1. Within and Inter Efficiency Scores

According to the program efficiency information in section 2, calculations related to efficiency were made in order to compute managerial and overall efficiency in this part. Program efficiency approach makes possible to calculate financial model differences of countries in the wake of interpretation of efficiency tables. Thus, good structure about the performance of countries both in terms of inter efficiency and its differential efficiencies over countries was created.

In Table 9 and 10, within and inter efficiency scores of the countries can be observed. These tables include implementation of VRS input oriented approach in order to find the efficiency scores of the countries. For all selected years, calculation of the efficiency scores of the countries was repeated 15 times. Moreover, all chosen input and output variables were integrated to the calculations and the model.

Within efficiency scores is given in Table 9. Countries were divided with respect to their health system model during the calculation. Moreover, it is possible to see the health system model discrimination in the table. Like mentioned in above section colors show the different health system models. It can be seen 210 observations for Beveridge system in total for 15 years. Besides, 149 efficient observation can be seen out of these 210 observation. Likewise, 93 efficient observation can be seen out of 195 observation for Bismarck model during whole selected years. 58 efficient observation out of 60 for National Health Insurance Model and finally 33 efficient observation out of 45 for Out-of-pocket system can be watched. And also countries' systems can be followed with respect to color discrimination.

Inter efficiency scores is given in Table 10 which includes all countries for each year without considering their financial system differences and calculations were made according to this approach. This time 219 efficient observation were found out of 510 observation.

As it can be seen from the Table 9 and Table 10, the number of the efficient countries are significantly low

Countrie	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	1	1	1	1	1	1	1	1	1	1	1	0.993	0.972	0.966	1
Denmark	0.802	0.867	0.859	0.913	0.859	0.883	0.860	0.870	0.831	0.792	0.769	0.786	0.824	0.794	0.802
Finland	1	1	1	1	1	1	1	1	1	0.992	0.943	0.918	0.972	0.998	1
Greece	1	1	1	1	1	1	1	1	1	0.941	1	1	1	1	1
Iceland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ireland	0.952	0.888	0.889	0.843	0.809	0.830	0.828	0.810	0.826	0.843	0.875	1	1	1	1
Italy	1	0.978	1	1	1	1	1	1	1	1	1	0.970	0.997	1	1
New Zealan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Norway	0.783	0.789	0.843	0.882	0.874	0.834	0.817	0.788	0.781	0.783	0.763	0.724	0.720	0.779	0.777
Portugal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Slovenia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Spain	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sweden	1	1	1	1	1	1	1	0.964	0.971	0.968	0.927	0.868	0.846	0.864	0.874
United King	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mean Eff.	**0.967**	**0.966**	**0.971**	**0.974**	**0.967**	**0.968**	**0.965**	**0.959**	**0.958**	**0.951**	**0.948**	**0.947**	**0.952**	**0.957**	**0.961**
Austria	0.722	0.737	0.712	0.708	0.721	0.723	0.700	0.711	0.683	0.660	0.669	0.687	0.681	0.680	0.682
Belgium	0.759	0.750	0.731	0.765	0.759	0.829	0.739	0.744	0.738	0.745	0.754	0.769	0.773	0.769	0.768
Czech Repu	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Estonia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
France	0.864	0.826	0.812	0.852	0.891	0.874	0.868	0.873	0.843	0.820	0.845	0.869	0.882	0.873	0.872
Germany	0.819	0.806	0.799	0.796	0.803	0.799	0.780	0.774	0.746	0.731	0.718	0.717	0.716	0.719	0.684
Hungary	0.869	0.802	0.777	0.770	0.793	0.797	0.812	0.873	0.867	0.917	0.968	0.996	1	1	1
Japan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Luxembour	0.898	0.882	0.876	0.882	1	1	1	1	1	1	1	1	1	1	1
Netherland	0.824	0.812	0.797	0.821	0.788	0.874	0.776	0.767	0.770	0.817	0.825	0.810	0.800	0.819	0.815
Poland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Slovak Repu	1	1	1	1	0.980	0.878	0.805	0.788	0.757	0.826	0.852	0.895	0.894	0.892	0.891
Israel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mean Eff.	**0.904**	**0.893**	**0.885**	**0.892**	**0.903**	**0.906**	**0.883**	**0.887**	**0.877**	**0.886**	**0.895**	**0.903**	**0.904**	**0.904**	**0.901**
Canada	1	1	1	1	1	1	1	1	1	1	1	1	1	0.851	0.865
Korea	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Turkey	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mexico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mean Eff.	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0.963**	**0.966**
Chile	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Switzerland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
US	0.929	0.854	0.810	0.756	0.737	0.706	0.754	0.743	0.740	0.769	0.907	0.961	1	1	1
Mean Eff.	**0.976**	**0.951**	**0.937**	**0.919**	**0.912**	**0.902**	**0.918**	**0.914**	**0.913**	**0.923**	**0.969**	**0.987**	**1**	**1**	**1**

Table 9. Efficiency Scores for VRS model with yearly frontiers and within-financing system frontiers

It will be better to interpret the countries according to their health system model for Table 9. In Beveridge model, 6 countries out of 14 which are Iceland, New Zealand, Portugal, Slovenia, Spain and UK show full efficient scores for all selected years. The country showing the lowest efficiency from among all Beveridge system countries is Norway. The efficiency scores of Norway vary between 72% - 88%. The efficiency scores show an increasing trend from 2000 to 2005, but after 2005 a decreasing trend is initiated until 2013, and the last efficiency score obtained if lower than the first efficiency score. A similar situation can be observed for Denmark. Lower efficiency scores than the other Beveridge countries can be seen for Denmark, too.

Moreover, it is possible to see the health system model discrimination from the table. Every color mentions a different health system model. Colors are the same as defined above. Lower efficiency scores may be observed when Bismarck countries are considered. There are only 5 countries which show full efficiency during all selected years such as Czech Republic, Estonia, Poland, Israel and Japan. The country which has lower efficiency score is Austria and efficiency scores of it are getting lower in time. When all observations are checked for all years in this model, efficiency of Bismarck countries are approximately 80-85%.

Member countries of National Health Insurance Model are almost 100% efficient. This system has 58 efficient observations out of 60. Only Canada has two inefficient rank for last two selected years. Other three countries which are Turkey, Mexico and Korea show full efficiency during all years.

Finally, when the Out-of-Pocket system countries are examined, efficiency level is found quite high again. Two member countries of this system which are Chile and Switzerland show full efficiency. Only US has lower efficiency level and it has a downward trend on its efficiency level until 2010. Afterwards, efficiency scores became higher suddenly and US became also efficient during the last three selected years. It is possible to associate this unexpected situation about US with Obama Care Act.

Countri	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	0,788	0,779	0,746	0,756	0,768	0,804	0,787	0,806	0,776	0,698	0,765	0,770	0,770	0,720	0,702
Denmark	0,725	0,731	0,719	0,769	0,727	0,756	0,716	0,722	0,715	0,701	0,692	0,708	0,724	0,706	0,704
Finland	1	1	1	1	1	1	0,994	0,958	0,987	0,948	0,921	0,896	0,936	0,932	1
Greece	0,889	0,877	0,849	0,869	0,881	0,911	0,868	0,872	0,849	0,843	0,938	1	1	1	1
Iceland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ireland	0,733	0,707	0,690	0,727	0,689	0,708	0,656	0,640	0,647	0,650	0,673	0,764	0,769	0,809	0,790
Italy	0,855	0,835	0,859	0,873	0,912	0,919	0,902	0,896	0,863	0,847	0,900	0,921	0,964	1	0,985
New Zeala	0,831	0,809	0,801	0,942	0,950	0,999	0,937	0,996	0,943	0,879	0,920	0,929	0,938	0,851	0,837
Norway	0,645	0,647	0,659	0,673	0,645	0,672	0,624	0,623	0,631	0,658	0,674	0,671	0,645	0,669	0,644
Portugal	0,901	0,920	0,962	1	1	1	1	1	1	1	1	1	1	0,997	0,992
Slovenia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Spain	1	1	0,976	0,843	0,899	0,861	0,879	0,882	0,862	0,865	0,980	1	1	1	1
Sweden	1	1	0,956	0,983	1	0,943	0,922	0,883	0,884	0,883	0,870	0,845	0,780	0,757	0,746
United Kir	1	0,992	0,963	0,995	1	1	1	0,989	1	1	1	1	1	1	1
Austria	0,694	0,711	0,694	0,683	0,661	0,685	0,675	0,691	0,669	0,652	0,662	0,664	0,641	0,636	0,639
Belgium	0,690	0,690	0,684	0,699	0,723	0,737	0,725	0,742	0,724	0,699	0,718	0,728	0,736	0,742	0,753
Czech Rep	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Estonia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
France	0,845	0,807	0,797	0,826	0,849	0,852	0,853	0,863	0,833	0,809	0,834	0,858	0,850	0,822	0,793
Germany	0,777	0,770	0,767	0,763	0,749	0,764	0,741	0,741	0,722	0,722	0,698	0,684	0,675	0,662	0,629
Hungary	0,808	0,759	0,737	0,750	0,773	0,781	0,806	0,866	0,850	0,881	0,915	0,968	1	0,979	0,971
Japan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Luxembou	0,843	0,846	0,858	0,873	0,948	1	1	1	1	1	1	1	1	1	1
Netherlan	0,631	0,628	0,642	0,667	0,658	0,676	0,771	0,762	0,759	0,778	0,788	0,774	0,765	0,783	0,786
Poland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Slovak Re	1	1	1	1	0,948	0,855	0,785	0,759	0,723	0,755	0,772	0,833	0,831	0,829	0,829
Israel	0,863	0,894	0,923	1	1	1	1	1	1	1	1	1	1	1	1
Canada	0,745	0,751	0,746	0,781	0,754	0,858	0,736	0,751	0,730	0,715	0,818	0,840	0,838	0,842	0,847
Korea, Re	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Turkey	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mexico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chile	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Switzerlar	0,680	0,674	0,640	0,655	0,693	0,723	0,679	0,704	0,629	0,600	0,665	1	0,639	0,592	0,552
United Sta	0,498	0,495	0,505	0,505	0,505	0,493	0,496	0,493	0,505	0,519	0,657	0,702	0,739	0,771	0,815
MEAN	**0,866**	**0,862**	**0,858**	**0,872**	**0,875**	**0,882**	**0,869**	**0,872**	**0,862**	**0,856**	**0,878**	**0,899**	**0,889**	**0,885**	**0,883**

Table 10. Efficiency Scores for VRS model with yearly frontiers and inter-financing system frontier

In Table 9 mean efficiency levels may be seen. Mean efficiency scores of the National Health Insurance Model, Out-of-pocket model, Beveridge model and finally Bismarck model follow decreasing trend, respectively.

As it is mentioned in the above, Table 10 shows the inter efficiency scores of the countries. When it is checked the general frame of the table, countries have lower efficiency scores than Table 9 and the number of efficient countries is also lower. Iceland, Slovenia, Estonia, Czech Republic, Japan, Poland, Korea, Turkey, Mexico and Chile are efficient countries during all selected years. In this angle, solutions show compatibility with other researches' results and OECD resources. Likewise, US has one of the country having highest health expenditure rates, however, efficiency score is lower than the countries which do not have that much health expenditure rate. Moreover, efficiency score of US shows some limited decrease and increase between the years of 2000 to 2009. After 2009, efficiency score of US started to increase and showed 14% increase suddenly. After this point, increase lasted continuously and US became one of the country which has higher efficiency level in 2014.

When it is checked both within and inter efficiency tables, it can be mentioned that Iceland, Slovenia, Czech Rep., Estonia, Poland, Japan, Korea, Turkey, Mexico and Chile are 'globally efficient' countries because these countries show efficiency in both within and inter efficiency calculation for all selected years. However, Denmark, Norway, Austria, Belgium, France and Germany are 'absolutely inefficient' countries. These absolutely inefficient countries are never being located on the frontier in any cases during all selected years.

4.3.2. Comparison of Health System Models

Table 11 shows the program efficiency values of health system models. When this calculation was being made, every value of inter and within efficiency table were divided with each other separately. Afterwards, program efficiency values of countries belong to same health system model were averaged for each year. Table 11 presents a good frame

to see efficiency of financial systems. Also, this table gives a chance to make comparison between the health system models.

System	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Overall Average Values Over Time
Beveridge	0.912	0.907	0.893	0.909	0.918	0.925	0.906	0.909	0.903	0.896	0.926	0.943	0.938	0.926	0.919	0.918
Bismarck	0.946	0.953	0.962	0.968	0.960	0.961	0.988	0.990	0.988	0.979	0.978	0.978	0.976	0.977	0.970	0.974
National Health Insurance	0.936	0.938	0.937	0.9454	0.9384	0.9644	0.9339	0.9376	0.9325	0.9286	0.9546	0.9599	0.9594	0.997	0.995	0.950
Out-of-Pocket	0.739	0.751	0.754	0.774	0.793	0.807	0.779	0.789	0.770	0.758	0.796	0.910	0.793	0.787	0.789	0.793

Table 11. Average program efficiency values of all health system models for all selected years

As is can be observed from the Table 11, National Health Insurance Model and Bismarck model have a higher program efficiency values for all years. In fact, it's hard to discriminate these two system. Many times Bismarck system gets the highest efficiency values while time to time efficiency value of National Health Insurance model is higher than Bismarck. Beveridge model shows reasonably high program efficiency scores. The program mean efficiency of these 3 system is around 90% - 95%. This means that, approximately 5%-10% of inefficiency observed in countries is attributed to the financing system they belong to. This value is low when we compare with the Out-of- pocket system, which has a very low program efficiency score. For example in 2012, 13 and 14 about 20% of countries' inefficiency could be attributed to the fact that their financing system was the Out-of- Pocket.

Overall average values for each system over the full time periods can also be observed from the above table. These values enable to see more efficient health system model. Even if the values are so similar, it can be arrayed the systems from the most efficient to less efficient respectively as Bismarck (97%), National Health Insurance (95%), Beveridge(92%) and Out-of-Pocket (79%).

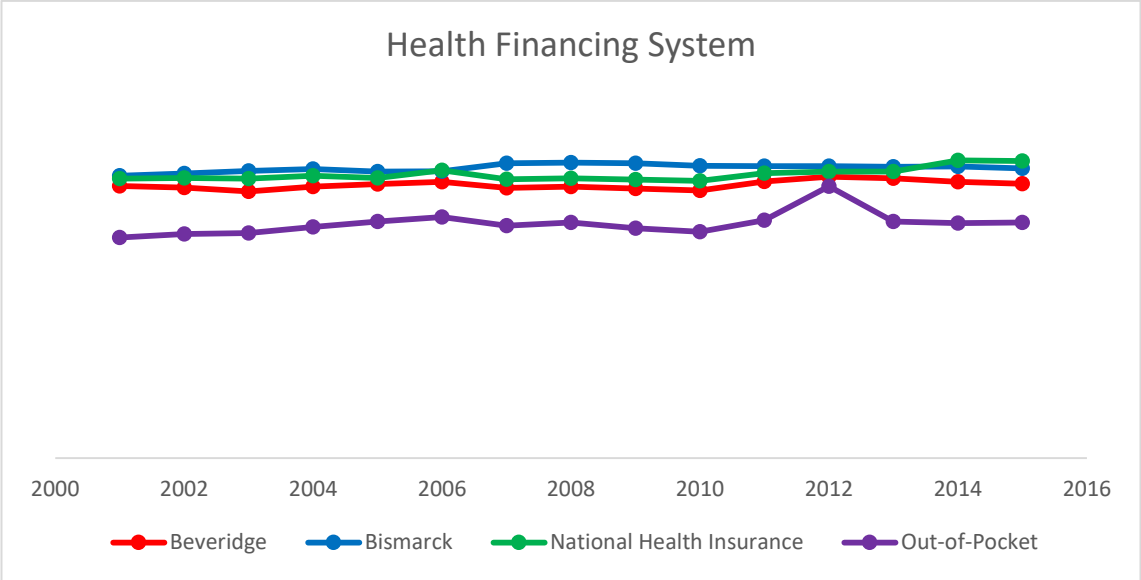


Figure 12. Average program efficiency values of all health system models for all selected years.

As is seen clearly from the Figure 12, out-of-pocket system has lower scores during all selected years except 2011. Observing to the level of efficiency scores and determining better financial system are easy with this figure.

It is possible to observe all these interpretations and the allocation of the variables from Figure 13, visually. As is seen, it creates a good structure to evaluate every system separately in within, inter and program efficiency level.

In Figure 13, straight line shows within efficiency mean values, dotted line shows inter efficiency mean values and dashed line shows program efficiency values of all health system models for all selected years. This figure can be considered as a summary for reading the general manner of all calculated efficiencies in system level instead of trying to read all efficiency values separately from Table 9, 10 and 11.

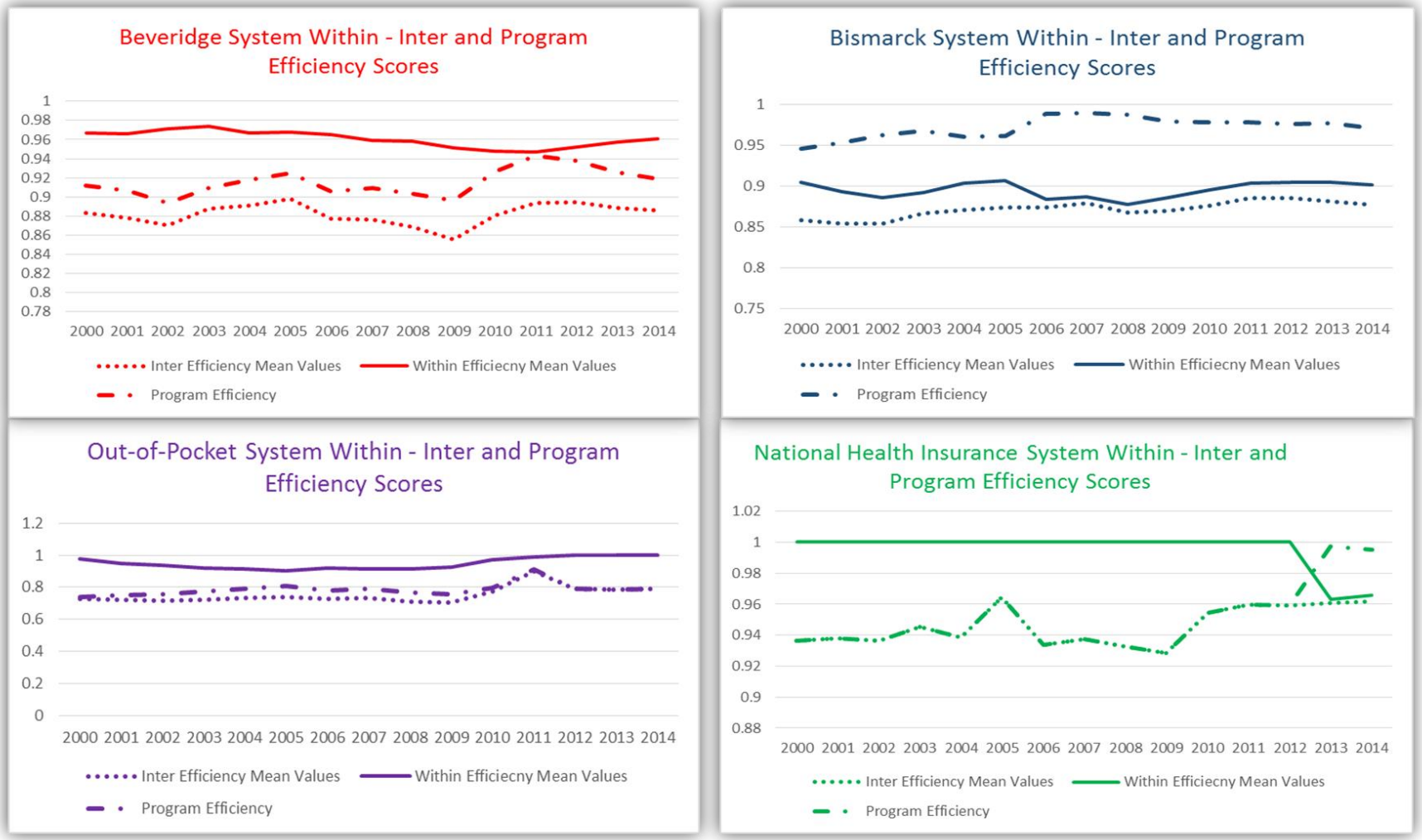


Figure 13. Within – Inter and Program Efficiency Scores for every Health System Models (Beveridge, Bismarck, National Health Insurance and Out-of-Pocket) separately

4.3.3. The Most Relatively Efficient Unit

In Tables 12 and 13 the set of peers and weight of peers is seen, respectively. Their values were calculated with respect to within efficiency and inter efficiency in 2014. To interpret the current situation, 2014 was selected, however, it is possible to follow other peer and weight tables for all selected years in the appendix part of the study.

2014	peer1	peer2	peer3	peer4	Finlan	Greece	Iceland	Irelanc	Italy	New Z	Portug	Sloven	Spain	UK
Australia	Ireland	Sloven	Spain	NA	0	0	0	0,309	0	0	0	0,097	0,594	0
Denmark	Iceland	Sloven	UK	NA	0	0	0,053	0	0	0	0	0,399	0	0,548
Finland	Finland	NA	NA	NA	1	0	0	0	0	0	0	0	0	0
Greece	Greece	NA	NA	NA	0	1	0	0	0	0	0	0	0	0
Iceland	Iceland	NA	NA	NA	0	0	1	0	0	0	0	0	0	0
Ireland	Ireland	NA	NA	NA	0	0	0	1	0	0	0	0	0	0
Italy	Italy	NA	NA	NA	0	0	0	0	1	0	0	0	0	0
New Zeala	New Zeala	NA	NA	NA	0	0	0	0	0	1	0	0	0	0
Norway	Iceland	Sloven	Spain	UK	0	0	0,590	0	0	0	0	0,190	0,100	0,120
Portugal	Portugal	NA	NA	NA	0	0	0	0	0	0	1	0	0	0
Slovenia	Slovenia	NA	NA	NA	0	0	0	0	0	0	0	1	0	0
Spain	Spain	NA	NA	NA	0	0	0	0	0	0	0	0	1	0
Sweden	Iceland	Italy	Sloven	UK	0	0	0,440	0	0,305	0	0	0,085	0	0,170
UK	UK	NA	NA	NA	0	0	0	0	0	0	0	0	0	1

	peer1	peer2	peer3	Czech I	Estonia	Hungar	Japan	Luxem	Poland	Israel
Austria	Japan	Poland	Israel	0	0	0	0,601	0	0,346	0,053
Belgium	Japan	Poland	NA	0	0	0	0,523	0	0,477	0
Czech Rep	Czech Rep	NA	NA	1	0	0	0	0	0	0
Estonia	Estonia	NA	NA	0	1	0	0	0	0	0
France	Japan	Poland	Israel	0	0	0	0,468	0	0,090	0,443
Germany	Estonia	Japan	Poland	0	0,025	0	0,562	0	0,412	0
Hungary	Hungary	NA	NA	0	0	1	0	0	0	0
Japan	Japan	NA	NA	0	0	0	1	0	0	0
Luxembou	Luxembou	NA	NA	0	0	0	0	1	0	0
Netherlan	Czech Rep	Japan	Poland	0,283	0	0	0,589	0	0,128	0
Poland	Poland	NA	NA	0	0	0	0	0	1	0
Slovak Re	Hungary	Poland	NA	0	0	0,184	0	0	0,892	0
Israel	Israel	NA	NA	0	0	0	0	0	0	1

	peer1	peer2	Korea	Turkey	Mexico
Canada	Korea	Turkey	0,967	0,033	0
Korea	Korea	NA	1	0	0
Turkey	Turkey	NA	0	1	0
Mexico	Mexico	NA	0	0	1

	peer1	Chile	Switze	US
Chile	Chile	1	0	0
Switzerlar	Switzerlar	0	1	0
US	US	0	0	1

Table 12. Calculated peers and weights of peers according to within-health system model in 2014

DEA defines a set of relatively efficient units for each inefficient unit. These relatively efficient units show peer group for inefficient unit. (Martic, Novakovic, & Baggia, 2009) If one inefficient unit is compared with the efficient units which were selected by linear programming directly, it can be created a relative connection between efficient and inefficient unit according to these efficient unit's weight value. The highest weight value indicates the most relevant reference unit. The efficient unit which is not used as reference for any inefficient unit is the unique and this efficient unit can be compared only with itself. (Mansson, May 2003)

As can be followed from Table 12, Beveridge system includes 10 efficient countries out of 14 and inefficient Beveridge countries are Australia, Denmark, Norway and Sweden. Likewise, Bismarck system includes 7 efficient countries out of 13 and inefficient Bismarck countries Austria, Belgium, France, Germany, Netherlands and Slovak Republic. Canada is the only inefficient country for National Health Insurance system. Other three member countries of National Health Insurance model are efficient. Besides, there is no inefficient country of Out-of-Pocket System for 2014.

When it is checked the peers and weight values of inefficient countries of Beveridge, it is possible to say that only 6 efficient countries which are Ireland, Slovenia, Spain, UK, Iceland and Italy out of 10 efficient countries existed as a peer of one of the calculated inefficient country. Other 4 efficient countries which are Finland, Greece, Portugal and New Zealand didn't appear as peers of inefficient countries. These 4 efficient countries cannot be used as reference for any inefficient unit and cannot be compared with any other Beveridge member countries. However, peer set of Australia consists of Ireland, Slovenia and Spain. When it is followed the weights of peers, weight value of Spain is the most relevant reference unit for Australia, since it has the highest weight value (0,594) between set of peers. Likewise, weight value of UK is the most relevant unit for Denmark. Finally, Iceland is the most relevant unit for both Norway and Sweden in 2014 because of the level of weight values.

When it is seen the member countries of Bismarck system, it can be observed that all efficient countries except Luxembourg existed as a peer of inefficient countries. The

particular point is that if Japan appears as one of the peer of one inefficient country, the highest peer weight is always assigned to Japan. Thus, the most relevant reference unit of inefficient Bismarck countries is always Japan except for one country. Slovak Republic is the only country which does not include Japan inside its set of peers between inefficient Bismarck countries. The most relevant reference unit of Slovak Republic is Poland with weight value of 89%.

Only inefficient country is Canada for National Health Insurance System in 2014. It has two peers which are Korea and Turkey. Korea is the most relevant reference unit of Canada with almost full rank (0.967).

Table 13 includes peer values and weights of peers for inter efficiency analysis as is mentioned above. Table 12 provides an opportunity to see and to determine the relevancy of countries according to model restriction while Table 13 will provide an opportunity to see and to determine the relevancy of all countries without any restriction. Thus, it will be possible to see which country corresponding the different health system model has a higher weight value and the level of reference of this country on inefficient country. So, it will be possible to make an interpretation about which health system model is better than the other.

Countries	Peers		Countries	Peers		Countries	Peers	
Australia	Greece	0.028	Norway	Iceland	0.155	France	Greece	0.096
	Slovenia	0.131		Estonia	0.228		Slovenia	0.064
	Japan	0.272		Japan	0.514		Estonia	0.041
	Korea	0.440		Luxembour	0.134		Japan	0.542
	Chile	0.129	Portugal	Greece	0.432		Chile	0.258
Denmark	UK	0.027		Slovenia	0.493	Germany	Greece	0.009
	Estonia	0.266		Estonia	0.047		Slovenia	0.685
	Japan	0.505		Chile	0.028		Estonia	0.040
	Poland	0.184	Sweden	Greece	0.068		Japan	0.078
	Turkey	0.018		Slovenia	0.059		Chile	0.188
Ireland	Japan	0.312		Estonia	0.213	Hungary	Poland	0.742
	Korea	0.656		Japan	0.663		Mexico	0.018
	Turkey	0.033	Austria	Greece	0.179		Chile	0.240
Italy	Spain	0.542		Slovenia	0.333	Netherland	UK	0.488
	Estonia	0.163		Estonia	0.097		Estonia	0.042
	Japan	0.357		Japan	0.287		Japan	0.344
	Chile	0.000		Chile	0.139		Poland	0.126
New Zealan	Czech Rep,	0.182	Belgium	Japan	0.655	Switzerland	Greece	0.048
	Japan	0.541		Poland	0.025		Slovenia	0.025
	Turkey	0.152		Korea	0.089		Japan	0.609
	Chile	0.172		Chile	0.231		Korea	0.136
Canada	Korea	0.709	Slovak Rep,	Poland	0.739		Chile	0.183
	Turkey	0.006		Turkey	0.117	US	Korea	0.713
	Chile	0.285		Mexico	0.143		Turkey	0.290

Table 13. Calculated peers and weights of peers for inter-health system model in 2014

There are maximum 5 peers calculated for 2014. Calculated inefficient countries, their peers and weight of peers can be observed from Table 13. Moreover, in total 18 inefficient countries and 16 efficient countries out of 34 can be mentioned. The number of inefficient countries in Table 13 are exactly two times more than the number of inefficient countries in Table 12.

According to Table 13, it is possible to say that some peers of the inefficient countries show similarities. For example, Chile appears as a peer of 11 different inefficient countries. Likewise, Japan appears as a peer of 13 different inefficient countries. Estonia, Turkey and Korea follow that array as the other most appeared peers of inefficient countries. However, Finland and Israel do not appear as a peer of any inefficient country. Thus, it can be mentioned that these countries cannot be compared with the other countries.

Similar interpretations in group analysis (Table 12) about the most relevant units can also be made for every inefficient countries in Table 13. For example, Australia has 5 peers and Korea is the most relevant reference unit for it (0.44).

4.3.4. Identifying Sources of Waste

This chapter includes calculated target values of all countries without any health system model restriction. In other words, inter efficiency values were used and input target values were calculated. Firstly, all target values were separately calculated for all input variables year by year. Next, these year by year calculations' solutions were summed to find the total digit of target and observation values for all selected countries. Then, summed observation and target values were summed again according to countries belonged to same health system model. Afterwards, summed observation and target values were divided with each other.

The purpose of this calculation was to create a summary table with targets, expressed in percentage of the observed values (targets/observed), to see where the model identifies more waste. Table 14 indicates this calculated percentages. This table will provide a frame to see how many inputs were being wasted by countries and systems in total.

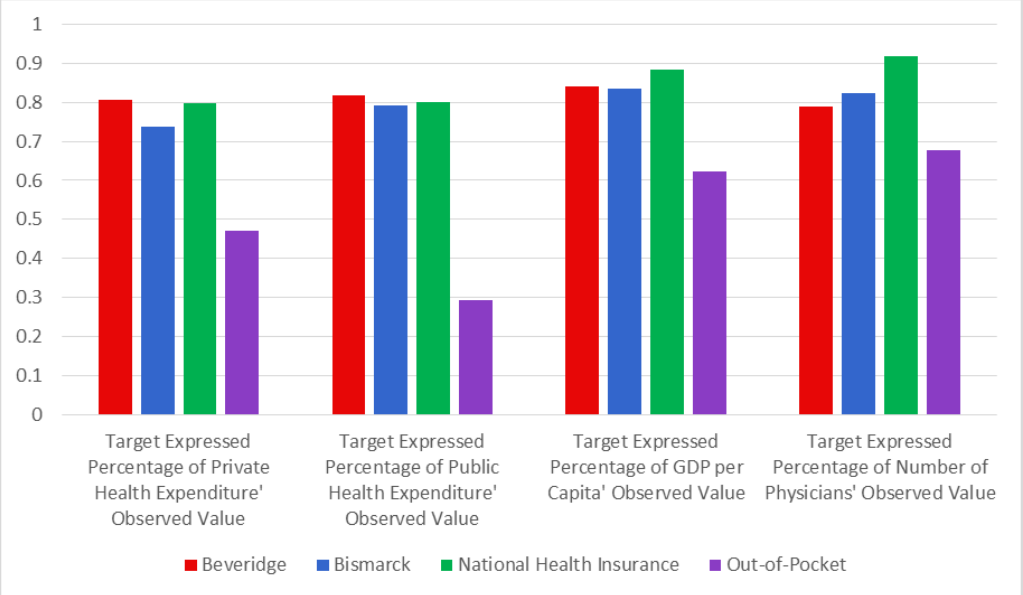
Countries ans Systems	Target Expressed Percentage of Private Health Expenditure' Observed Value	Target Expressed Percentage of Public Health Expenditure' Observed Value	Target Expressed Percentage of GDP per Capita' Observed Value	Target Expressed Percentage of Number of Physician' Observed Value
Australia	0.73	0.57	0.74	0.68
Denmark	0.58	0.73	0.71	0.73
Finland	0.96	0.88	0.93	0.97
Greece	0.92	0.77	0.93	0.63
Iceland	1.00	1.00	1.00	1.00
Ireland	0.60	0.70	0.64	0.71
Italy	0.90	0.86	0.90	0.63
New Zealan	0.83	0.90	0.90	0.88
Norway	0.55	0.65	0.62	0.65
Portugal	0.97	0.94	0.99	0.92
Slovenia	1.00	1.00	1.00	1.00
Spain	0.94	0.91	0.93	0.75
Sweden	0.79	0.86	0.85	0.79
UK	0.92	0.99	0.92	0.99
Beveridge	0.81	0.82	0.84	0.79
Austria	0.57	0.63	0.67	0.60
Belgium	0.61	0.68	0.71	0.71
Czech Rep,	1.00	1.00	1.00	1.00
Estonia	1.00	1.00	1.00	1.00
France	0.68	0.78	0.84	0.77
Germany	0.56	0.64	0.72	0.72
Hungary	0.71	0.81	0.87	0.70
Japan	1.00	1.00	1.00	1.00
Luxembourg	0.90	0.93	0.86	0.96
Netherlands	0.57	0.63	0.69	0.74
Poland	1.00	1.00	1.00	1.00
Slovak Rep,	0.68	0.81	0.84	0.76
Israel	0.91	0.94	0.95	0.96
Bismarck	0.74	0.79	0.83	0.82
Canada	0.64	0.55	0.71	0.74
Korea	1.00	1.00	1.00	1.00
Turkey	1.00	1.00	1.00	1.00
Mexico	1.00	1.00	1.00	1.00
National He	0.80	0.80	0.88	0.92
Chile	1.00	1.00	1.00	1.00
Switzerland	0.68	0.37	0.67	0.62
US	0.20	0.16	0.45	0.60
Out-of-Pock	0.47	0.29	0.62	0.68

Table 14. Targets expressed in percentage of the observed values for sum of all selected years.

According to Table 14, for Beveridge health system model the input where most savings can be done is number of physicians, whereas for Out-of-Pocket the input that can be reduced more is public health expenditure followed by private health expenditure. For National Health Insurance Model the inputs that can be reduced are same for public and private health expenditure. However, savings can be done for other two inputs (GDP per Capita and Number of Physicians) of National Health Insurance are quite low. Moreover, for Bismarck health system model the inputs that can be reduced approximately same level are public health expenditure, GDP per Capita and Number of Physicians with 17-21% followed by private health expenditure with 26%. As it may be noticed from these interpretations, every health system model has a different input where most saving can be done. For example, it can be made a deduction that Beveridge system countries employee more doctor than the necessity of country according to the target expressed value.

Graph 9 illustrates visual representation of target expressed value of all input variables. It will be easier to make interpretation about savings percentage amongst systems.

The number of member countries of systems is not equal. One of them includes 15 member country while one other includes only three member countries. This situation prevent to make comparison on country level and to use absolute terms for comparison. That is why ratios were computed.



Graph 9. Visual representation of target expressed percentages for all input variables and for all systems

As it can be seen from the Graph 9, Out-of-Pocket system has the highest potential to reduce private health expenditure (to 47% of observed levels). Other three health system models have almost similar waste ratio on private health expenditure. However, it is possible to array these three systems from highest waste ratio to lowest as Bismarck (26%), National Health Insurance (20%) and Beveridge (19%), respectively.

Similar observation can be done for Public Health Expenditure' saving percentage. Out-of-Pocket again has the highest saving percentage. Rest of the health systems' savings are again show similarity and their rankings are from the highest to lowest Bismarck 21%, National Health Insurance 20% and Beveridge 18%.

For Number of Physicians, National Health Insurance System has the lowest waste with 8%. Besides, other health system models' waste value are also low. They can be ranked from the lowest waste percentage to the highest as Bismarck 18%, Beveridge 21% and Out-of-Pocket 32%.

When looked into the general frame, the percentage of saving is the highest for Out-of-Pocket and ratios of other countries' savings show similarity.

Regarding GDP we cannot interpret the percentage savings identified as a waste of resources as an higher GDP is associated with better living conditions for the population. As a result, the savings identified can be seen as the amount by which GDP could be reduced without compromising the level of the two outputs considered. Given the different nature of GDP when compared with the other inputs, we decided to analyse its influence on the computed efficiency scores (see next section).

4.3.5. The Effect of GDP

GDP was treated in the previous points as a discretionary variable. However, we may question the discretionary nature of this variable since in general countries do not have a direct control over this variable in the short run. In addition its consideration as an input implies that the lower the GDP the better (for the same level of outputs) which is not a correct assumption in this setting. So we decided to analyze the effect of this variable in our results.

According to information given in the above, following part of the study include a specific analysis to see the effect of health resources on health outcomes. Table 15 includes only Private health expenditure. Public health expenditure and number of physicians were integrated to the model as input variables. Same output variables were used with above efficiency calculations. Calculation were made without health system model restriction, in other words, inter efficiency scores were found.

Thus, seeing the effect of GDP per capita on efficiency score and understanding the effect of health resources on output variables at the same time is the reason of this new efficiency score calculation.

Private health expenditure and public health expenditure are the financiers of health; at the same time these values can be considered as a financial resource of country. Likewise, number of physicians can be also considered as a financial resource of country. The behind logic of this idea is that governments spend money and time to treat good and adequate physicians so the number of physicians values can be considered as a human capital.

According to light of these explanations, new efficiency score table can be observed at below. When Table 15 is checked, it can be observed that there are 202 efficient DMU out of 510.

Column1	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	0,722	0,753	0,719	0,735	0,727	0,801	0,735	0,755	0,738	0,676	0,731	0,758	0,726	0,691	0,695
Denmark	0,725	0,731	0,719	0,769	0,727	0,756	0,716	0,707	0,715	0,699	0,692	0,708	0,724	0,705	0,704
Finland	1	1	1	1	1	1	0,994	0,958	0,987	0,948	0,921	0,887	0,905	0,904	0,968
Greece	0,886	0,841	0,832	0,789	0,749	0,687	0,659	0,644	0,588	0,667	0,740	0,806	0,963	0,981	0,954
Iceland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ireland	0,733	0,707	0,690	0,727	0,689	0,708	0,656	0,640	0,624	0,611	0,635	0,764	0,769	0,809	0,790
Italy	0,831	0,797	0,802	0,821	0,837	0,849	0,840	0,863	0,824	0,841	0,890	0,921	0,964	1	0,985
New Zealan	0,820	0,778	0,797	0,942	0,944	0,997	0,903	0,994	0,872	0,829	0,854	0,887	0,888	0,838	0,837
Norway	0,633	0,633	0,640	0,673	0,644	0,672	0,624	0,623	0,626	0,653	0,671	0,671	0,645	0,669	0,642
Portugal	0,647	0,690	0,713	0,774	0,831	0,829	0,851	0,847	0,819	0,808	0,800	0,858	0,861	0,887	0,869
Slovenia	0,867	0,935	1	1	1	1	1	1	1	1	1	1	1	1	1
Spain	1	1	0,976	0,832	0,896	0,856	0,857	0,858	0,827	0,836	0,947	1	1	1	1
Sweden	1	1	0,956	0,983	1	0,943	0,922	0,883	0,884	0,883	0,870	0,845	0,764	0,719	0,680
United King	1	0,992	0,963	0,995	1	1	1	0,989	1	1	1	1	1	1	1
Austria	0,488	0,512	0,509	0,513	0,510	0,531	0,541	0,558	0,558	0,544	0,550	0,581	0,580	0,579	0,584
Belgium	0,589	0,613	0,600	0,642	0,656	0,710	0,661	0,653	0,665	0,660	0,695	0,718	0,734	0,740	0,751
Czech Repul	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Estonia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
France	0,616	0,605	0,607	0,655	0,657	0,683	0,668	0,681	0,678	0,668	0,698	0,746	0,753	0,744	0,729
Germany	0,586	0,592	0,588	0,607	0,583	0,615	0,579	0,577	0,574	0,569	0,567	0,570	0,564	0,555	0,557
Hungary	0,752	0,678	0,639	0,675	0,652	0,697	0,669	0,724	0,769	0,806	0,777	0,791	0,854	0,884	0,859
Japan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Luxembourg	0,843	0,846	0,858	0,873	0,948	1	1	1	1	1	1	1	1	1	1
Netherlands	0,612	0,612	0,626	0,658	0,630	0,676	0,771	0,762	0,759	0,778	0,788	0,774	0,765	1	0,786
Poland	1	1	1	1	1	1	1	1	1	1	1	1	1	0,783	1
Slovak Repu	1	1	1	1	0,892	0,811	0,673	0,647	0,623	0,607	0,644	0,684	0,663	1	0,686
Israel	0,863	0,894	0,923	1	1	1	1	1	1	1	1	1	1	0,689	1
Canada	0,745	0,751	0,746	0,781	0,754	0,858	0,736	0,751	0,730	0,715	0,818	0,840	0,838	0,842	0,847
Korea, Rep,	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Turkey	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mexico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chile	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Switzerland	0,680	0,674	0,640	0,620	0,664	0,718	0,676	0,704	0,626	0,594	0,665	1	0,639	0,588	0,513
United State	0,498	0,495	0,505	0,505	0,505	0,493	0,496	0,493	0,505	0,519	0,657	0,702	0,739	0,771	0,815

Table 15. Efficiency values of all countries without any model restriction for three input and two output variables (VRS-Input oriented)

New efficiency scores created without GDP per capita does not much different from the inter efficiency in Table 10. Countries which showed efficiency during all selected years are almost the same but only Slovenia and Poland show difference.

Australia, Italy, New Zealand, Norway, Spain, Austria, Belgium, Hungary, Netherlands, and Canada show a bit lower but quite similar efficiency scores with above inter efficiency table (Table 10). So, it can be mentioned that effect of GDP per capita on these countries so low, however, it can be noted that there is a positive effect of GDP per capita value on selected output variables even if it is so small.

Denmark, Finland, Ireland, Sweden, UK, Luxembourg, and US have a same level of efficiency scores in both efficiency table indiscriminatingly. Besides, Switzerland has more or less same efficiency level during all selected years. So, it can be said that GDP per capita has no effect on these DMUs.

Greece has a lower efficiency scores. Especially, between the years of 2005 and 2010, difference between efficiency scores approximately 25-30%. Likewise, France shows almost 20% lower efficiency scores until 2012. Efficiency scores start to show similarity only last two observation year. In addition, efficiency scores of Germany are 20% lower during all selected years.

Efficiency score of Portugal shows great decrease from 2000 to 2004. Efficiency score is again lower than inter efficiency scores in following years but not much as first four years.

Slovenia has more or less same efficiency scores with inter efficiency table. Only first two years, efficiency scores of Slovenia are a bit lower while scores are efficient and same during the all other years. Likewise, efficiency scores calculated without GDP per capita of Israel are same with inter efficiency scores. Only difference happens in 2013. The reason of these sudden decrease could be temporary and periodical deflation.

Efficiency scores of Slovak Republic are a bit changeable. Efficiency scores are same for first 4 years while next 9 years, efficiency scores calculated without GDP per capita

variable are approximately 10% lower than the inter efficiency scores calculated with all input variables. However, efficiency value calculated without GDP per Capita variable shows increase suddenly and gets higher value in 2013 for one year. Afterwards, there can be observed a huge and sudden efficiency decrease in 2014 again.

So it can be interpreted that effect of GDP per capita is limited and changeable on DMUs. This effect also depends on the countries welfare or economic situation. According to countries economic situation, effect of GDP per Capita can be neutral or negative on DMUs.

With all above tables and explanations, it was tried to be analyzed efficiency level of health system models of OECD countries.

Efficiency score shows the availability of data. Clearly, efficiency measures reliability and authenticity of selected data because there are many exogenous factors which may affect the data. With the help of the implementation of this method, the effect of these exogenous factors on healthcare systems outcome was tried to be understood.

Next part of the study is the conclusion part. All conclusions and important points will be explained in this part.

5. CONCLUSION

The objective of this dissertation was to recognize the health system model which provides a better health system performance and to investigate healthcare system performances of countries.

Two different kinds of analysis were implemented on variables, which are linear regression analysis and DEA. The purpose of applying linear regression analysis is to see the general frame of data and to understand the relationship of variables with each other and with time.

As it is mentioned in data and sample part of the study, public and private health expenditure variables were taken to measure a health financing effect, GDP per capita was taken to measure the welfare effect and number of physicians was taken to measure the healthcare resources on health outcome. Moreover, GDP per capita was accepted as a non-discretionary variable while other selected input variables were accepted as a discretionary variable in the last part of the DEA analysis because of the basic economical assumption. To understand the efficiency level of countries, the effect of these input variables on selected output variables, which are life expectancy and infant survival rate, were investigated.

According to the findings of the linear regression analysis part, countries which have higher health resources have higher private health expenditure rates. There is a slightly positive linear relationship between number of physicians and private health expenditures. However, public health expenditure and GDP per capita do not have any linear relationship with number of physicians. On the other hand, negative correlation can be observed between them. If countries did not have very high expenditure rates, this relationship would be observed strongly positive.

When linear regression analysis was being implemented, Dummy Variable was used to measure the effect of health system model and Beveridge system was chosen as a base case. For infant survival rate, effect of health system differences is low. However, it can

be mentioned that Bismarck, National Health Insurance System and Out-of-Pocket systems show more years of life expectancy than Beveridge, In addition, year was also included to the model as an independent variable. According to the solutions, life expectancy and year have a slightly positive relationship over time, while there is no particular relationship between infant survival rate and year.

After the linear regression analysis part, DEA was implemented on variables to understand the efficiency level of countries. According to these efficiency scores, giving advice to countries for making their health system performance level higher was aimed. During the DEA part, not only relevant efficiency scores were found but also peer sets were created and target values were calculated. Peer sets were created to find the most relatively efficient units for inefficient unit. Also DEA found the weight value of these calculated peers for every inefficient group. The highest weight value indicates the most relevant reference unit. Moreover, target values were calculated to find the best frontier for each inefficient unit and accordingly system.

Efficiency score calculations were made in three different levels. Firstly countries were separated according to the health system model to which they belonged (within efficiency). Then, without any separation, overall efficiency scores were found (inter efficiency). Finally, GDP per capita was eliminated and efficiency scores of countries were calculated again according to the rest of the input and output in the last part of the study.

During all these calculations, the highest efficiency scores of countries were found within efficiency level calculations because of lower sample size. Other calculations include less efficient country and lower efficiency scores of countries. However, to understand the countries efficiency levels globally efficient countries which are Iceland, Slovenia, Czech Rep., Estonia, Japan, Poland, Korea, Turkey, Mexico and Chile and absolutely inefficient countries which are Denmark, Norway, Austria, Belgium, France and Germany should be taken into account. These countries were efficient and inefficient countries for all selected years. Moreover, calculated efficiency scores when GDP per capita is eliminated are also similar with inter efficiency scores.

Program efficiency calculations were made to understand which health system model is better than the others. Besides, this calculation creates a chance to compare all countries and systems with each other. According to the results of the program efficiency scores, Bismarck and National Health Insurance models have better efficiency scores. Afterwards, Beveridge and Out-of-Pocket systems are following the range. It should also be mentioned that National Health Insurance, Bismarck and Beveridge have very similar program efficiency scores. Only particular gap can be observed for Out-of-pocket health system model. Thus, health system performances of National Health Insurance, Beveridge and Bismarck's member countries show similarity.

When compared with previous studies, our findings show similarity with their findings. However, a wider time range and the latest data were chosen for this dissertation. So, different findings that show the current situation of countries can be observed. For example, although the US has very high health expenditure and GDP per capita ratios during all time, its efficiency score was found to be always low by previous studies. Moreover, some articles were created only to understand the reason of this situation. According to our findings, the US is one of the countries which have the lowest efficiency scores just like previous studies. Nonetheless, after 2010 US efficiency scores start increase. Furthermore, in the last 3 selected years, US within efficiency scores were found on the frontier. Likewise, US inter efficiency scores show an increase and converge to be efficient, too. However, calculated efficiency scores without GDP per capita variable for the US show a huge decrease. When the observation values of the US for the last 3 observation years are checked, it can be observed that GDP per capita values start to decrease. So, these solutions are compatible. Similarly, private and public health expenditure rates of the US also show a huge decrease. When the target tables are checked, it can be seen that waste percentage of the US is very high for health expenditure variables separately. In other words, according to target calculations, the US should have reduced its spending to be efficient. As can be seen, the US reduced its health expenditure ratios and became efficient. Similar interpretations can be made for all countries and accordingly health system models.

Moreover, target values were calculated for all input variables on the bases of health systems. Calculated percentages show the ratio should be decreased by systems or accordingly countries. Countries can prevent wasting their resources with respected to these calculated target values and become efficient or converge to be an efficient. Thus, it can be considered that target calculations show that which health system model' member countries need to reduce which expense item to become more efficient. Calculated target expressed values provide us a comparison chance to all models with each other and also with own self on input variables. According to these calculations, Beveridge health system model the input where the most savings can be done is number of physicians. Furthermore, the input required the most reduction is private heath expenditure for Bismarck model countries. Besides, Out-of-Pocket system countries waste their inputs on public health expenditure more. Finally, National Health Insurance model' countries should reduce their private and public health expenditure expenses at the same level to become more efficient. However, when it is looked the general wastes of models and countries, it is easy to say that Out-of-Pocket system' countries have more waste on every input variable.

Besides all these conclusions, it is good to talk about the limitations and difficulties of the study. In this study tried to be found better health system model used currently by OECD countries. However, to say something certain about better health system model according to the found efficiencies, it should be investigated first whether the countries implement the health system model as it should be or not. It is hard to say that all countries implement the health system models as required.

Input and output variables which are chose for this study do not explain the all story. Number of physicians were chose as an input variable to understand the health resources of countries. To measure the health resources of countries, number of physicians may be create a good structure but it is not possible to say that this variable is enough by oneself. It could be checked the different doctor compositions or different health resource variables such as number of beds of health facilities could be counted to the model. As an output the most used variables in literature were chose, however, next studies may

consider different output variables which may be measure and show the efficiencies better.

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APPENDIXES

AP.1. All Countries and Health System Models Belonged To

Coutries	System belonged to	Coutries	System belonged to
Australia	Beveridge	Japan	Bismarck
Austria	Bismarck	Korea, Rep.	Mix
Belgium	Bismarck	Luxembourg	Bismarck
Canada	Mix	Mexico	Mix
Chile	Out-of-pocket	Netherlands	Bismarck
Czech Republic	Bismarck	New Zealand	Beveridge
Denmark	Beveridge	Norway	Beveridge
Estonia	Bismarck	Poland	Bismarck
Finland	Beveridge	Portugal	Beveridge
France	Bismarck	Slovak Republic	Bismarck
Germany	Bismarck	Slovenia	Beveridge
Greece	Beveridge	Spain	Beveridge
Hungary	Bismarck	Sweden	Beveridge
Iceland	Beveridge	Switzerland	Out-of-pocket
Ireland	Beveridge	Turkey	Mix
Israel	Bismarck	United Kingdom	Beveridge
Italy	Beveridge	United States	Out-of-pocket

AP.2. INTER EFFICIENCY – CALCULATED PEERS and WEIGHTS TABLES for all selected years

2000	peer1	peer2	peer3	peer4		Finald	Iceland	Slovenia	Spain	Sweden	UK	Czech Re	Estonia	Japan	Poland	Slovak R	Korea	Turkey	Mexico	Chile
Australia	Slovenia	Japan	Korea	Chile	Australia	0,000	0,000	0,150	0,000	0,000	0,000	0,000	0,000	0,595	0,000	0,000	0,017	0,000	0,000	0,238
Denmark	Czech Rep	Japan	Korea	NA	Denmark	0,000	0,000	0,000	0,000	0,000	0,000	0,271	0,000	0,397	0,000	0,000	0,332	0,000	0,000	0,000
Finland	Finland	NA	NA	NA	Finland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Spain	Japan	Korea	Chile	Greece	0,000	0,000	0,000	0,159	0,000	0,000	0,000	0,000	0,257	0,000	0,000	0,158	0,000	0,000	0,426
Iceland	Iceland	NA	NA	NA	Iceland	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	UK	Czech Rep	Korea	Chile	Ireland	0,000	0,000	0,000	0,000	0,000	0,309	0,085	0,000	0,000	0,000	0,000	0,439	0,000	0,000	0,167
Italy	Slovenia	Japan	Korea	Chile	Italy	0,000	0,000	0,051	0,000	0,000	0,000	0,000	0,000	0,732	0,000	0,000	0,093	0,000	0,000	0,125
New Zealand	Slovenia	Czech Rep	Japan	Chile	New Zeala	0,000	0,000	0,003	0,000	0,000	0,000	0,170	0,000	0,430	0,000	0,000	0,000	0,000	0,000	0,397
Norway	Slovenia	Sweden	Czech Rep	Japan	Norway	0,000	0,000	0,118	0,000	0,021	0,000	0,138	0,000	0,723	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Slovenia	Japan	Chile	NA	Portugal	0,000	0,000	0,554	0,000	0,000	0,000	0,000	0,000	0,118	0,000	0,000	0,000	0,000	0,000	0,335
Slovenia	Slovenia	NA	NA	NA	Slovenia	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	Spain	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Sweden	Sweden	NA	NA	NA	Sweden	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	UK	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Slovenia	Japan	Chile	NA	Austria	0,000	0,000	0,524	0,000	0,000	0,000	0,000	0,000	0,402	0,000	0,000	0,000	0,000	0,000	0,074
Belgium	Slovenia	Japan	Chile	NA	Belgium	0,000	0,000	0,568	0,000	0,000	0,000	0,000	0,000	0,318	0,000	0,000	0,000	0,000	0,000	0,114
Czech Rep.	Czech Rep	NA	NA	NA	Czech Re	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Slovenia	Japan	Chile	NA	France	0,000	0,000	0,313	0,000	0,000	0,000	0,000	0,000	0,595	0,000	0,000	0,000	0,000	0,000	0,092
Germany	Slovenia	Japan	Chile	NA	Germany	0,000	0,000	0,540	0,000	0,000	0,000	0,000	0,000	0,404	0,000	0,000	0,000	0,000	0,000	0,056
Hungary	Estonia	Turkey	Chile	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,566	0,000	0,000	0,000	0,000	0,008	0,000	0,426
Japan	Japan	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Japan	Korea	NA	NA	Luxembou	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,813	0,000	0,000	0,188	0,000	0,000	0,000
Netherland	Slovenia	Japan	Korea	Chile	Netherla	0,000	0,000	0,060	0,000	0,000	0,000	0,000	0,000	0,404	0,000	0,000	0,373	0,000	0,000	0,163
Poland	Poland	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Slovak Rep	NA	NA	NA	Slovak R	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Israel	Spain	Korea	Chile	NA	Israel	0,000	0,000	0,000	0,803	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,097	0,000	0,000	0,100
Canada	Japan	Korea	Chile	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,550	0,000	0,000	0,246	0,000	0,000	0,204
Korea	Korea	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Spain	Japan	Korea	Chile	Switzerl	0,000	0,000	0,000	0,425	0,000	0,000	0,000	0,000	0,471	0,000	0,000	0,086	0,000	0,000	0,017
US	Japan	Korea	Chile	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,066	0,000	0,000	0,433	0,000	0,000	0,501

2001	peer1	peer2	peer3	peer4		Finald	Iceland	Slovenia	Spain	Sweden	Czech Rep,	Estonia	Japan	Poland	Slovak R	Korea	Turkey	Mexico	Chile
Australia	Slovenia	Japan	Korea	Chile	Australia	0,000	0,000	0,045	0,000	0,000	0,000	0,000	0,626	0,000	0,000	0,055	0,000	0,000	0,274
Denmark	Czech Rep	Japan	Korea	NA	Denmark	0,000	0,000	0,000	0,000	0,000	0,255	0,000	0,404	0,000	0,000	0,341	0,000	0,000	0,000
Finland	Finland	NA	NA	NA	Finland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Spain	Japan	Korea	Chile	Greece	0,000	0,000	0,000	0,048	0,000	0,000	0,000	0,403	0,000	0,000	0,099	0,000	0,000	0,449
Iceland	Iceland	NA	NA	NA	Iceland	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Czech Rep	Japan	Korea	Chile	Ireland	0,000	0,000	0,000	0,000	0,000	0,156	0,000	0,173	0,000	0,000	0,442	0,000	0,000	0,229
Italy	Slovenia	Japan	Korea	Chile	Italy	0,000	0,000	0,074	0,000	0,000	0,000	0,000	0,736	0,000	0,000	0,079	0,000	0,000	0,111
New Zealand	Slovenia	Czech Rep	Japan	Chile	New Zeal	0,000	0,000	0,033	0,000	0,000	0,082	0,000	0,433	0,000	0,000	0,000	0,000	0,000	0,453
Norway	Slovenia	Czech Rep	Japan	NA	Norway	0,000	0,000	0,063	0,000	0,000	0,181	0,000	0,756	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Slovenia	Japan	Chile	NA	Portugal	0,000	0,000	0,551	0,000	0,000	0,000	0,000	0,132	0,000	0,000	0,000	0,000	0,000	0,317
Slovenia	Slovenia	NA	NA	NA	Slovenia	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	Spain	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Sweden	Sweden	NA	NA	NA	Sweden	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	Czech Rep	Japan	Korea	Chile	UK	0,000	0,000	0,000	0,000	0,000	0,241	0,000	0,388	0,000	0,000	0,151	0,000	0,000	0,221
Austria	Slovenia	Japan	Chile	NA	Austria	0,000	0,000	0,441	0,000	0,000	0,000	0,000	0,442	0,000	0,000	0,000	0,000	0,000	0,117
Belgium	Slovenia	Japan	Chile	NA	Belgium	0,000	0,000	0,542	0,000	0,000	0,000	0,000	0,323	0,000	0,000	0,000	0,000	0,000	0,135
Czech Rep,	Czech Rep	NA	NA	NA	Czech Rep	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Slovenia	Japan	Chile	NA	France	0,000	0,000	0,322	0,000	0,000	0,000	0,000	0,559	0,000	0,000	0,000	0,000	0,000	0,118
Germany	Slovenia	Japan	Chile	NA	Germany	0,000	0,000	0,522	0,000	0,000	0,000	0,000	0,406	0,000	0,000	0,000	0,000	0,000	0,072
Hungary	Estonia	Turkey	Chile	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,389	0,000	0,000	0,000	0,000	0,009	0,000	0,602
Japan	Japan	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Japan	Korea	NA	NA	Luxembou	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,857	0,000	0,000	0,143	0,000	0,000	0,000
Netherland	Slovenia	Japan	Korea	Chile	Netherlan	0,000	0,000	0,065	0,000	0,000	0,000	0,000	0,362	0,000	0,000	0,435	0,000	0,000	0,138
Poland	Poland	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Slovak Rep	NA	NA	NA	Slovak Rep	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Israel	Spain	Korea	Chile	NA	Israel	0,000	0,000	0,000	0,844	0,000	0,000	0,000	0,000	0,000	0,000	0,083	0,000	0,000	0,073
Canada	Japan	Korea	Chile	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,549	0,000	0,000	0,206	0,000	0,000	0,245
Korea	Korea	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Spain	Japan	Korea	Chile	Switzerlar	0,000	0,000	0,000	0,400	0,000	0,000	0,000	0,511	0,000	0,000	0,008	0,000	0,000	0,080
US	Japan	Korea	Chile	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,386	0,000	0,000	0,453	0,000	0,000	0,508

2002	peer1	peer2	peer3	peer4		Finald	Iceland	Slovenia	Czech Rep,	Estonia	Japan	Poland	Slovak Rep,	Korea	Turkey	Mexico	Chile
Australia	Slovenia	Japan	Chile	NA	Australia	0,000	0,000	0,060	0,000	0,000	0,164	0,000	0,000	0,000	0,000	0,000	0,324
Denmark	Czech Rep	Japan	Chile	NA	Denmark	0,000	0,000	0,000	0,239	0,000	0,612	0,000	0,000	0,000	0,000	0,000	0,148
Finland	Finland	NA	NA	NA	Finland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Slovenia	Japan	Korea	Chile	Greece	0,000	0,000	0,030	0,000	0,000	0,406	0,000	0,000	0,165	0,000	0,000	0,400
Iceland	Iceland	NA	NA	NA	Iceland	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Czech Rep	Japan	Chile	NA	Ireland	0,000	0,000	0,000	0,069	0,000	0,533	0,000	0,000	0,000	0,000	0,000	0,398
Italy	Slovenia	Japan	Korea	Chile	Italy	0,000	0,000	0,146	0,000	0,000	0,696	0,000	0,000	0,041	0,000	0,000	0,118
New Zealand	Czech Rep	Japan	Chile	NA	New Zeala	0,000	0,000	0,000	0,113	0,000	0,436	0,000	0,000	0,000	0,000	0,000	0,451
Norway	Slovenia	Czech Rep	Japan	Chile	Norway	0,000	0,000	0,202	0,088	0,000	0,701	0,000	0,000	0,000	0,000	0,000	0,009
Portugal	Slovenia	Japan	Chile	NA	Portugal	0,000	0,000	0,623	0,000	0,000	0,125	0,000	0,000	0,000	0,000	0,000	0,253
Slovenia	Slovenia	NA	NA	NA	Slovenia	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Japan	Korea	Chile	NA	Spain	0,000	0,000	0,000	0,000	0,000	0,591	0,000	0,000	0,069	0,000	0,000	0,339
Sweden	Iceland	Japan	NA	NA	Sweden	0,000	0,200	0,000	0,000	0,000	0,800	0,000	0,000	0,000	0,000	0,000	0,000
UK	Czech Rep	Japan	Chile	NA	UK	0,000	0,000	0,000	0,233	0,000	0,459	0,000	0,000	0,000	0,000	0,000	0,308
Austria	Slovenia	Japan	Chile	NA	Austria	0,000	0,000	0,454	0,000	0,000	0,407	0,000	0,000	0,000	0,000	0,000	0,139
Belgium	Slovenia	Japan	Chile	NA	Belgium	0,000	0,000	0,531	0,000	0,000	0,325	0,000	0,000	0,000	0,000	0,000	0,144
Czech Rep,	Czech Rep	NA	NA	NA	Czech Re	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Slovenia	Japan	Chile	NA	France	0,000	0,000	0,356	0,000	0,000	0,525	0,000	0,000	0,000	0,000	0,000	0,119
Germany	Slovenia	Japan	Chile	NA	Germany	0,000	0,000	0,557	0,000	0,000	0,355	0,000	0,000	0,000	0,000	0,000	0,087
Hungary	Estonia	Turkey	Chile	NA	Hungary	0,000	0,000	0,000	0,000	0,368	0,000	0,000	0,000	0,000	0,006	0,000	0,626
Japan	Japan	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Japan	Korea	NA	NA	Luxembou	0,000	0,000	0,000	0,000	0,000	0,917	0,000	0,000	0,083	0,000	0,000	0,000
Netherland	Slovenia	Japan	Korea	Chile	Netherla	0,000	0,000	0,060	0,000	0,000	0,522	0,000	0,000	0,194	0,000	0,000	0,225
Poland	Poland	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Slovak Re	NA	NA	NA	Slovak R	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Israel	Japan	Korea	Chile	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,510	0,000	0,000	0,150	0,000	0,000	0,340
Canada	Japan	Korea	Chile	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,513	0,000	0,000	0,204	0,000	0,000	0,282
Korea	Korea	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Korea	Chile	NA	Switzerl	0,000	0,000	0,000	0,000	0,000	0,741	0,000	0,000	0,024	0,000	0,000	0,236
US	Korea	Chile	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,485	0,000	0,000	0,515

2003	peer1	peer2	peer3	peer4	peer5		Finald	Iceland	Portugal	Slovenia	Czech Rep,	Estonia	Japan	Poland	Slovak R	Israel	Korea	Turkey	Mexico	Chile
Australia	Japan	Chile	NA	NA	NA	Australia	0,000	0,000	0,000	0,000	0,000	0,000	0,674	0,000	0,000	0,000	0,000	0,000	0,000	0,326
Denmark	Czech Rep	Japan	Poland	NA	NA	Denmark	0,000	0,000	0,000	0,000	0,126	0,000	0,609	0,265	0,000	0,000	0,000	0,000	0,000	0,000
Finland	Finland	NA	NA	NA	NA	Finland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Slovenia	Japan	Korea	Chile	NA	Greece	0,000	0,000	0,000	0,069	0,000	0,000	0,444	0,000	0,000	0,000	0,137	0,000	0,000	0,349
Iceland	Iceland	NA	NA	NA	NA	Iceland	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Poland	Korea	Chile	NA	Ireland	0,000	0,000	0,000	0,000	0,000	0,000	0,320	0,206	0,000	0,000	0,436	0,000	0,000	0,038
Italy	Slovenia	Japan	Korea	Chile	NA	Italy	0,000	0,000	0,000	0,203	0,000	0,000	0,665	0,000	0,000	0,000	0,055	0,000	0,000	0,078
New Zealand	Japan	Poland	Turkey	Chile	NA	New Zea	0,000	0,000	0,000	0,000	0,000	0,000	0,640	0,229	0,000	0,000	0,000	0,055	0,000	0,076
Norway	Slovenia	Czech Rep	Japan	Poland	NA	Norway	0,000	0,000	0,000	0,009	0,058	0,000	0,861	0,072	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	NA	Portugal	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	NA	Sloveni	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Slovenia	Japan	Poland	Korea	Chile	Spain	0,000	0,000	0,000	0,038	0,000	0,000	0,551	0,005	0,000	0,000	0,057	0,000	0,000	0,349
Sweden	Iceland	Japan	NA	NA	NA	Sweden	0,000	0,167	0,000	0,000	0,000	0,000	0,833	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	Japan	Poland	Turkey	Chile	NA	UK	0,000	0,000	0,000	0,000	0,000	0,000	0,501	0,428	0,000	0,000	0,000	0,007	0,000	0,065
Austria	Portugal	Slovenia	Japan	Chile	NA	Austria	0,000	0,000	0,653	0,033	0,000	0,000	0,289	0,000	0,000	0,000	0,000	0,000	0,000	0,024
Belgium	Slovenia	Japan	Chile	NA	NA	Belgium	0,000	0,000	0,000	0,530	0,000	0,000	0,319	0,000	0,000	0,000	0,000	0,000	0,000	0,151
Czech Rep,	Czech Rep	NA	NA	NA	NA	Czech F	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Slovenia	Japan	NA	NA	France	0,000	0,000	0,540	0,052	0,000	0,000	0,409	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Germany	Portugal	Slovenia	Japan	Chile	NA	Germany	0,000	0,000	0,421	0,232	0,000	0,000	0,317	0,000	0,000	0,000	0,000	0,000	0,000	0,030
Hungary	Poland	Turkey	Chile	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,739	0,000	0,000	0,000	0,033	0,000	0,228
Japan	Japan	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Japan	Korea	NA	NA	NA	Luxembo	0,000	0,000	0,000	0,000	0,000	0,000	0,958	0,000	0,000	0,000	0,042	0,000	0,000	0,000
Netherland	Slovenia	Japan	Korea	Chile	NA	Nether	0,000	0,000	0,000	0,058	0,000	0,000	0,624	0,000	0,000	0,000	0,029	0,000	0,000	0,289
Poland	Poland	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Slovak Re	NA	NA	NA	NA	Slovak	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Israel	Israel	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Korea	Chile	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,540	0,000	0,000	0,000	0,138	0,000	0,000	0,322
Korea	Korea	NA	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Portugal	Japan	Chile	NA	NA	Switzer	0,000	0,000	0,038	0,000	0,000	0,000	0,737	0,000	0,000	0,000	0,000	0,000	0,000	0,225
US	Korea	Chile	NA	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,452	0,000	0,000	0,548

2004	peer1	peer2	peer3	peer4		Finald	Iceland	Portugal	Slovenia	Sweden	UK	Czech Re	Estonia	Japan	Poland	Israel	Korea	Turkey	Mexico	Chile
Australia	Japan	Chile	NA	NA	Australia	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,694	0,000	0,000	0,000	0,000	0,000	0,306
Denmark	Czech Rep	Japan	Poland	NA	Denmark	0,000	0,000	0,000	0,000	0,000	0,000	0,167	0,000	0,594	0,239	0,000	0,000	0,000	0,000	0,000
Finland	Finland	Slovenia	Japan	NA	Finland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,313	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Portugal	Japan	Korea	Chile	Greece	0,000	0,000	0,123	0,000	0,000	0,000	0,000	0,000	0,357	0,000	0,000	0,289	0,000	0,000	0,231
Iceland	Iceland	NA	NA	NA	Iceland	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Poland	Korea	NA	Ireland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,399	0,243	0,000	0,358	0,000	0,000	0,000
Italy	Portugal	Japan	Korea	Chile	Italy	0,000	0,000	0,230	0,000	0,000	0,000	0,000	0,000	0,695	0,000	0,000	0,024	0,000	0,000	0,051
New Zealand	Czech Rep	Japan	Poland	Turkey	New Zeala	0,000	0,000	0,000	0,000	0,000	0,000	0,008	0,000	0,667	0,275	0,000	0,000	0,050	0,000	0,000
Norway	Slovenia	Czech Rep	Japan	Poland	Norway	0,000	0,000	0,000	0,018	0,000	0,000	0,119	0,000	0,838	0,025	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	Portugal	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	Slovenia	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Japan	Israel	Chile	NA	Spain	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,553	0,000	0,163	0,000	0,000	0,000	0,284
Sweden	Sweden	Japan	NA	NA	Sweden	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	UK	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Portugal	Slovenia	Japan	Chile	Austria	0,000	0,000	0,640	0,030	0,000	0,000	0,000	0,000	0,272	0,000	0,000	0,000	0,000	0,000	0,058
Belgium	Portugal	Slovenia	Japan	Chile	Belgium	0,000	0,000	0,078	0,415	0,000	0,000	0,000	0,000	0,348	0,000	0,000	0,000	0,000	0,000	0,159
Czech Rep.	Czech Rep	NA	NA	NA	Czech Re	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Japan	Chile	NA	France	0,000	0,000	0,411	0,000	0,000	0,000	0,000	0,000	0,532	0,000	0,000	0,000	0,000	0,000	0,057
Germany	Portugal	Slovenia	Japan	Chile	Germany	0,000	0,000	0,420	0,206	0,000	0,000	0,000	0,000	0,305	0,000	0,000	0,000	0,000	0,000	0,069
Hungary	Poland	Turkey	Chile	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,731	0,000	0,000	0,024	0,000	0,244
Japan	Japan	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Iceland	Japan	NA	NA	Luxembou	0,000	0,167	0,000	0,000	0,000	0,000	0,000	0,000	0,833	0,000	0,000	0,000	0,000	0,000	0,000
Netherland	Slovenia	Japan	Korea	Chile	Netherla	0,000	0,000	0,000	0,149	0,000	0,000	0,000	0,000	0,364	0,000	0,000	0,309	0,000	0,000	0,178
Poland	Poland	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Czech Rep	Estonia	Poland	Turkey	Slovak R	0,000	0,000	0,000	0,000	0,000	0,000	0,145	0,223	0,000	0,508	0,000	0,000	0,124	0,000	0,000
Israel	Israel	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Korea	Chile	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,538	0,000	0,000	0,089	0,000	0,000	0,373
Korea	Korea	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Chile	NA	NA	Switzerl	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,816	0,000	0,000	0,000	0,000	0,000	0,184
US	Korea	Chile	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,364	0,000	0,000	0,636

2005	peer1	peer2	peer3	peer4	peer5	Finald	Iceland	Portugal	Slovenia	UK	Czech Re	Estonia	Japan	Luxembo	Poland	Israel	Korea	Turkey	Mexico	Chile
Australia	Japan	Israel	Chile	NA	NA	Australia	0,000	0,000	0,000	0,000	0,000	0,000	0,716	0,000	0,000	0,058	0,000	0,000	0,000	0,226
Denmark	Czech Rep	Japan	Poland	NA	NA	Denmark	0,000	0,000	0,000	0,000	0,094	0,000	0,634	0,000	0,271	0,000	0,000	0,000	0,000	0,000
Finland	Finland	NA	NA	NA	NA	Finland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Portugal	Japan	Israel	Chile	NA	Greece	0,000	0,321	0,000	0,000	0,000	0,000	0,214	0,000	0,000	0,294	0,000	0,000	0,000	0,170
Iceland	Iceland	Japan	NA	NA	NA	Iceland	1,000	0,000	0,000	0,000	0,000	0,000	0,152	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Poland	Korea	NA	NA	Ireland	0,000	0,000	0,000	0,000	0,000	0,000	0,336	0,000	0,119	0,000	0,546	0,000	0,000	0,000
Italy	Portugal	Japan	Chile	NA	NA	Italy	0,000	0,177	0,000	0,000	0,000	0,000	0,726	0,000	0,000	0,000	0,000	0,000	0,000	0,097
New Zealand	UK	Japan	Poland	Turkey	Chile	New Zealand	0,000	0,000	0,000	0,166	0,000	0,000	0,525	0,000	0,060	0,000	0,000	0,051	0,000	0,198
Norway	Japan	Poland	Korea	NA	NA	Norway	0,000	0,000	0,000	0,000	0,000	0,000	0,893	0,000	0,048	0,000	0,058	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	NA	Portugal	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	NA	Slovenia	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Portugal	Japan	Israel	Korea	Chile	Spain	0,000	0,012	0,000	0,000	0,000	0,000	0,533	0,000	0,000	0,134	0,001	0,000	0,000	0,321
Sweden	Iceland	Japan	NA	NA	NA	Sweden	0,167	0,000	0,000	0,000	0,000	0,000	0,833	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	NA	UK	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Portugal	Japan	Chile	NA	NA	Austria	0,000	0,543	0,000	0,000	0,000	0,000	0,335	0,000	0,000	0,000	0,000	0,000	0,000	0,122
Belgium	Slovenia	Japan	Korea	Chile	NA	Belgium	0,000	0,000	0,406	0,000	0,000	0,000	0,341	0,000	0,000	0,000	0,088	0,000	0,000	0,165
Czech Rep,	Czech Rep	NA	NA	NA	NA	Czech Rep,	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Japan	Chile	NA	NA	France	0,000	0,324	0,000	0,000	0,000	0,000	0,569	0,000	0,000	0,000	0,000	0,000	0,000	0,167
Germany	Portugal	Slovenia	Japan	Chile	NA	Germany	0,000	0,335	0,191	0,000	0,000	0,000	0,372	0,000	0,000	0,000	0,000	0,000	0,000	0,119
Hungary	Poland	Turkey	Chile	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,695	0,000	0,000	0,013	0,000	0,292
Japan	Japan	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	NA	Luxembourg	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Netherland	Japan	Korea	Chile	NA	NA	Netherlands	0,000	0,000	0,000	0,000	0,000	0,000	0,315	0,000	0,000	0,000	0,571	0,000	0,000	0,114
Poland	Poland	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Estonia	Poland	Turkey	NA	NA	Slovak Rep,	0,000	0,000	0,000	0,000	0,000	0,213	0,000	0,000	0,669	0,000	0,000	0,118	0,000	0,000
Israel	Israel	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Chile	NA	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,568	0,000	0,000	0,000	0,000	0,000	0,000	0,432
Korea	Korea	NA	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Israel	Chile	NA	NA	Switzerland	0,000	0,000	0,000	0,000	0,000	0,000	0,764	0,000	0,000	0,168	0,000	0,000	0,000	0,068
US	Korea	Chile	NA	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,314	0,000	0,000	0,686

2006	peer1	peer2	peer3	peer4		Iceland	Portugal	Slovenia	UK	Czech Re	Estonia	Japan	Luxembourg	Poland	Israel	Korea	Turkey	Mexico	Chile
Australia	Japan	Chile	NA	NA	Australia	0,000	0,000	0,000	0,000	0,000	0,000	0,705		0,000	0,000	0,000	0,000	0,000	0,295
Denmark	Slovenia	Czech Rep	Japan	Poland	Denmark	0,000	0,000	0,001	0,000	0,209	0,000	0,572		0,218	0,000	0,000	0,000	0,000	0,000
Finland	Iceland	Slovenia	Japan	NA	Finland	0,289	0,000	0,506	0,000	0,000	0,000	0,205		0,000	0,000	0,000	0,000	0,000	0,000
Greece	Portugal	Israel	Chile	NA	Greece	0,000	0,345	0,000	0,000	0,000	0,000	0,000		0,000	0,598	0,000	0,000	0,000	0,057
Iceland	Iceland	NA	NA	NA	Iceland	1,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Poland	Korea	Chile	Ireland	0,000	0,000	0,000	0,000	0,000	0,000	0,615		0,155	0,000	0,164	0,000	0,000	0,120
Italy	Portugal	Japan	Israel	Chile	Italy	0,000	0,150	0,000	0,000	0,000	0,000	0,713		0,000	0,043	0,000	0,000	0,000	0,094
New Zealand	Japan	Poland	Chile	NA	New Zeala	0,000	0,000	0,000	0,000	0,000	0,000	0,647		0,277	0,000	0,000	0,000	0,000	0,076
Norway	Czech Rep	Japan	Poland	NA	Norway	0,000	0,000	0,000	0,000	0,184	0,000	0,804		0,011	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	Portugal	0,000	1,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	Slovenia	0,000	0,000	1,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000
Spain	Japan	Israel	Chile	NA	Spain	0,000	0,000	0,000	0,000	0,000	0,000	0,604		0,000	0,170	0,000	0,000	0,000	0,226
Sweden	Iceland	Czech Rep	Japan	NA	Sweden	0,547	0,000	0,000	0,000	0,131	0,000	0,323		0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	UK	0,000	0,000	0,000	1,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000
Austria	Portugal	Japan	Poland	Chile	Austria	0,000	0,494	0,000	0,000	0,000	0,000	0,352		0,016	0,000	0,000	0,000	0,000	0,138
Belgium	Portugal	Slovenia	Japan	Chile	Belgium	0,000	0,078	0,431	0,000	0,000	0,000	0,294		0,000	0,000	0,000	0,000	0,000	0,197
Czech Rep,	Czech Rep	NA	NA	NA	Czech Re	0,000	0,000	0,000	0,000	1,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	1,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Japan	Israel	Chile	France	0,000	0,216	0,000	0,000	0,000	0,000	0,365		0,000	0,414	0,000	0,000	0,000	0,004
Germany	Portugal	Slovenia	Japan	Chile	Germany	0,000	0,404	0,179	0,000	0,000	0,000	0,305		0,000	0,000	0,000	0,000	0,000	0,112
Hungary	Poland	Mexico	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,948	0,000	0,000	0,000	0,052	0,000
Japan	Japan	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	1,000		0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	Luxembou	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000
Netherland	UK	Japan	Poland	Turkey	Netherla	0,000	0,000	0,000	0,147	0,000	0,000	0,564		0,279	0,000	0,000	0,014	0,000	0,000
Poland	Poland	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000		1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Poland	Mexico	NA	NA	Slovak R	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,813	0,000	0,000	0,000	0,190	0,000
Israel	Israel	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Korea	Chile	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,540		0,000	0,000	0,022	0,000	0,000	0,438
Korea	Korea	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Israel	Chile	NA	Switzerl	0,000	0,000	0,000	0,000	0,000	0,000	0,626		0,000	0,363	0,000	0,000	0,000	0,016
US	Korea	Chile	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,289	0,000	0,000	0,715

2007	peer1	peer2	peer3	peer4	peer5		Iceland	Portugal	Slovenia	Czech Re	Estonia	Japan	Luxembourg	Poland	Israel	Korea	Turkey	Mexico	Chile
Australia	Japan	Israel	Chile	NA	NA	Australi	0,000	0,000	0,000	0,000	0,000	0,749	0,000	0,000	0,026	0,000	0,000	0,000	0,225
Denmark	Slovenia	Czech Rep	Japan	Poland	NA	Denmar	0,000	0,000	0,120	0,198	0,000	0,474	0,000	0,207	0,000	0,000	0,000	0,000	0,000
Finland	Iceland	Slovenia	Japan	NA	NA	Finland	0,214	0,000	0,500	0,000	0,000	0,285	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Portugal	Japan	Israel	Chile	NA	Greece	0,000	0,510	0,000	0,000	0,000	0,154	0,000	0,000	0,177	0,000	0,000	0,000	0,159
Iceland	Iceland	NA	NA	NA	NA	Iceland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Poland	Korea	Chile	NA	Ireland	0,000	0,000	0,000	0,000	0,000	0,597	0,000	0,145	0,000	0,196	0,000	0,000	0,063
Italy	Portugal	Japan	Poland	Israel	Chile	Italy	0,000	0,155	0,000	0,000	0,000	0,723	0,000	0,002	0,017	0,000	0,000	0,000	0,133
New Zealand	Czech Rep	Japan	Poland	Turkey	NA	New Zea	0,000	0,000	0,000	0,157	0,000	0,671	0,000	0,064	0,000	0,000	0,178	0,000	0,000
Norway	Iceland	Czech Rep	Japan	NA	NA	Norway	0,030	0,000	0,000	0,184	0,000	0,786	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	NA	Portuga	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	NA	Sloveni	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Japan	Israel	Chile	NA	NA	Spain	0,000	0,000	0,000	0,000	0,000	0,602	0,000	0,000	0,203	0,000	0,000	0,000	0,195
Sweden	Iceland	Slovenia	Czech Rep	Japan	NA	Sweden	0,518	0,000	0,058	0,121	0,000	0,302	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	Czech Rep	Japan	Poland	Turkey	NA	UK	0,000	0,000	0,000	0,248	0,000	0,561	0,000	0,112	0,000	0,000	0,079	0,000	0,000
Austria	Portugal	Japan	Chile	NA	NA	Austria	0,000	0,426	0,000	0,000	0,000	0,407	0,000	0,000	0,000	0,000	0,000	0,000	0,167
Belgium	Portugal	Slovenia	Japan	Poland	NA	Belgiun	0,000	0,012	0,002	0,000	0,000	0,619	0,000	0,369	0,000	0,000	0,000	0,000	0,000
Czech Rep,	Czech Rep	NA	NA	NA	NA	Czech F	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Japan	Chile	NA	NA	France	0,000	0,201	0,000	0,000	0,000	0,659	0,000	0,000	0,000	0,000	0,000	0,000	0,141
Germany	Portugal	Japan	Poland	Chile	NA	Germany	0,000	0,369	0,000	0,000	0,000	0,444	0,000	0,140	0,000	0,000	0,000	0,000	0,047
Hungary	Poland	Mexico	NA	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,956	0,000	0,000	0,000	0,044	0,000
Japan	Japan	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	NA	Luxembo	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Netherland	Japan	Poland	Turkey	Chile	NA	Nether	0,000	0,000	0,000	0,000	0,000	0,686	0,000	0,289	0,000	0,000	0,024	0,000	0,001
Poland	Poland	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Poland	Mexico	NA	NA	NA	Slovak	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,807	0,000	0,000	0,000	0,193	0,000
Israel	Israel	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Chile	NA	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,588	0,000	0,000	0,000	0,000	0,000	0,000	0,412
Korea	Korea	NA	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Israel	NA	NA	NA	Switzer	0,000	0,000	0,000	0,000	0,000	0,700	0,000	0,000	0,300	0,000	0,000	0,000	0,000
US	Korea	Chile	NA	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,268	0,000	0,000	0,732

2008	peer1	peer2	peer3	peer4		Iceland	Portugal	Slovenia	UK	Czech Re	Estonia	Japan	Luxembourg	Poland	Israel	Korea	Turkey	Mexico	Chile
Australia	Japan	Israel	Chile	NA	Australia	0,000	0,000	0,000	0,000	0,000	0,000	0,653	0,000	0,000	0,137	0,000	0,000	0,000	0,213
Denmark	Czech Rep	Japan	Poland	NA	Denmark	0,000	0,000	0,000	0,000	0,229	0,000	0,575	0,000	0,196	0,000	0,000	0,000	0,000	0,000
Finland	Iceland	Slovenia	Japan	NA	Finland	0,278	0,000	0,472	0,000	0,000	0,000	0,250	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Portugal	Israel	Chile	NA	Greece	0,000	0,371	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,579	0,000	0,000	0,000	0,049
Iceland	Iceland	NA	NA	NA	Iceland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Slovenia	Japan	Poland	Korea	Ireland	0,000	0,000	0,011	0,000	0,000	0,000	0,469	0,000	0,239	0,000	0,280	0,000	0,000	0,000
Italy	Portugal	Japan	Poland	Chile	Italy	0,000	0,165	0,000	0,000	0,000	0,000	0,721	0,000	0,020	0,000	0,000	0,000	0,000	0,095
New Zealand	Japan	Poland	Turkey	Chile	New Zeal	0,000	0,000	0,000	0,000	0,000	0,000	0,669	0,000	0,098	0,000	0,000	0,150	0,000	0,128
Norway	Iceland	Czech Rep	Japan	Luxembou	Norway	0,028	0,000	0,000	0,000	0,181	0,000	0,658	0,132	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	Portugal	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	Slovenia	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Japan	Israel	Chile	NA	Spain	0,000	0,000	0,000	0,000	0,000	0,000	0,657	0,000	0,000	0,130	0,000	0,000	0,000	0,213
Sweden	Iceland	Slovenia	Czech Rep	Japan	Sweden	0,516	0,000	0,045	0,000	0,135	0,000	0,310	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	UK	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Portugal	Japan	Poland	Chile	Austria	0,000	0,375	0,000	0,000	0,000	0,000	0,434	0,000	0,051	0,000	0,000	0,000	0,000	0,140
Belgium	Slovenia	Japan	Poland	Korea	Belgium	0,000	0,000	0,023	0,000	0,000	0,000	0,484	0,000	0,342	0,000	0,151	0,000	0,000	0,000
Czech Rep	Czech Rep	NA	NA	NA	Czech Re	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Japan	Israel	Chile	France	0,000	0,196	0,000	0,000	0,000	0,000	0,444	0,000	0,000	0,304	0,000	0,000	0,000	0,056
Germany	Portugal	Japan	Poland	Chile	Germany	0,000	0,301	0,000	0,000	0,000	0,000	0,473	0,000	0,207	0,000	0,000	0,000	0,000	0,019
Hungary	Poland	Chile	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,773	0,000	0,000	0,000	0,000	0,227
Japan	Japan	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	Luxembou	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Netherland	UK	Japan	Poland	Turkey	Netherla	0,000	0,000	0,000	0,092	0,000	0,000	0,637	0,000	0,252	0,000	0,000	0,020	0,000	0,000
Poland	Poland	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Poland	Mexico	Chile	NA	Slovak R	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,743	0,000	0,000	0,000	0,182	0,075
Israel	Israel	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Chile	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,565	0,000	0,000	0,000	0,000	0,000	0,000	0,435
Korea	Korea	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Israel	Chile	NA	Switzerl	0,000	0,000	0,000	0,000	0,000	0,000	0,755	0,000	0,000	0,216	0,000	0,000	0,000	0,029
US	Korea	Chile	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,273	0,000	0,000	0,727

2009	peer1	peer2	peer3	peer4	peer5		Iceland	Portugal	Slovenia	UK	Czech Rep,	Estonia	Japan	Luxembourg	Poland	Israel	Korea	Turkey	Mexico	Chile
Australia	Japan	Israel	Korea	Chile	NA	Australia	0,000	0,000	0,000	0,000	0,000	0,000	0,525	0,000	0,000	0,175	0,137	0,000	0,000	0,163
Denmark	UK	Estonia	Japan	Poland	NA	Denmark	0,000	0,000	0,000	0,052	0,000	0,228	0,589	0,000	0,131	0,000	0,000	0,000	0,000	0,000
Finland	Iceland	Slovenia	Japan	NA	NA	Finland	0,257	0,000	0,529	0,000	0,000	0,000	0,214	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Portugal	Japan	Chile	NA	NA	Greece	0,000	0,480	0,000	0,000	0,000	0,000	0,308	0,000	0,000	0,000	0,000	0,000	0,000	0,212
Iceland	Iceland	NA	NA	NA	NA	Iceland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Slovenia	Japan	Korea	Chile	NA	Ireland	0,000	0,000	0,448	0,000	0,000	0,000	0,269	0,000	0,000	0,000	0,143	0,000	0,000	0,140
Italy	Portugal	Estonia	Japan	Israel	Chile	Italy	0,000	0,018	0,000	0,000	0,000	0,085	0,722	0,000	0,000	0,079	0,000	0,000	0,000	0,095
New Zealand	Japan	Poland	Turkey	Chile	NA	New Zea	0,000	0,000	0,000	0,000	0,000	0,000	0,670	0,000	0,095	0,000	0,000	0,122	0,000	0,113
Norway	Iceland	Czech Rep	Japan	Luxembou	NA	Norway	0,065	0,000	0,000	0,000	0,234	0,000	0,583	0,118	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	NA	Portugal	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	NA	Slovenia	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Japan	Israel	Chile	NA	NA	Spain	0,000	0,000	0,000	0,000	0,000	0,000	0,680	0,000	0,000	0,132	0,000	0,000	0,000	0,188
Sweden	Iceland	Czech Rep	Japan	NA	NA	Sweden	0,461	0,000	0,000	0,000	0,169	0,000	0,370	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	NA	UK	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Portugal	Estonia	Japan	Chile	NA	Austria	0,000	0,401	0,000	0,000	0,000	0,076	0,381	0,000	0,000	0,000	0,000	0,000	0,000	0,142
Belgium	Slovenia	Japan	Poland	Chile	NA	Belgium	0,000	0,000	0,459	0,000	0,000	0,000	0,309	0,000	0,025	0,000	0,000	0,000	0,000	0,206
Czech Rep,	Czech Rep	NA	NA	NA	NA	Czech R	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Japan	Chile	NA	NA	France	0,000	0,233	0,000	0,000	0,000	0,000	0,615	0,000	0,000	0,000	0,000	0,000	0,000	0,152
Germany	Portugal	Slovenia	Japan	Chile	NA	Germany	0,000	0,351	0,251	0,000	0,000	0,000	0,270	0,000	0,000	0,000	0,000	0,000	0,000	0,128
Hungary	Estonia	Chile	NA	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,541	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,459
Japan	Japan	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	NA	Luxembo	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Netherland	UK	Japan	Poland	Chile	NA	Nether	0,000	0,000	0,000	0,279	0,000	0,000	0,503	0,000	0,186	0,000	0,000	0,000	0,000	0,031
Poland	Poland	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Poland	Turkey	Chile	NA	NA	Slovak	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,485	0,000	0,000	0,090	0,000	0,425
Israel	Israel	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Korea	Chile	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,562	0,000	0,000	0,000	0,003	0,000	0,000	0,436
Korea	Korea	NA	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Israel	Korea	Chile	NA	Switzer	0,000	0,000	0,000	0,000	0,000	0,000	0,716	0,000	0,000	0,164	0,056	0,000	0,000	0,065
US	Korea	Chile	NA	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,289	0,000	0,000	0,711

2010	peer1	peer2	peer3	peer4	peer5		Iceland	Portugal	Slovenia	UK	Czech Rep,	Estonia	Japan	Luxembourg	Poland	Israel	Korea	Turkey	Mexico	Chile
Australia	Japan	Israel	Korea	Chile	NA	Australia	0,000	0,000	0,000	0,000	0,000	0,000	0,533	0,000	0,000	0,317	0,007	0,000	0,000	0,144
Denmark	Estonia	Japan	Poland	NA	NA	Denmark	0,000	0,000	0,000	0,000	0,000	0,250	0,577	0,000	0,173	0,000	0,000	0,000	0,000	0,000
Finland	Iceland	Slovenia	Luxembou	NA	NA	Finland	0,253	0,000	0,667	0,000	0,000	0,000	0,000	0,080	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Portugal	Israel	Chile	NA	NA	Greece	0,000	0,394	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,517	0,000	0,000	0,000	0,089
Iceland	Iceland	NA	NA	NA	NA	Iceland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Slovenia	Japan	Israel	Korea	Chile	Ireland	0,000	0,000	0,280	0,000	0,000	0,000	0,320	0,000	0,000	0,031	0,252	0,000	0,000	0,125
Italy	Estonia	Japan	Israel	Turkey	Chile	Italy	0,000	0,000	0,000	0,000	0,000	0,021	0,734	0,000	0,000	0,151	0,000	0,003	0,000	0,091
New Zealand	Estonia	Japan	Turkey	Chile	NA	New Zea	0,000	0,000	0,000	0,000	0,000	0,023	0,675	0,000	0,000	0,000	0,000	0,124	0,000	0,178
Norway	Iceland	Czech Rep	Japan	Luxembou	NA	Norway	0,121	0,000	0,000	0,000	0,226	0,000	0,519	0,134	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	NA	Portugal	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	NA	Sloven	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Japan	Israel	NA	NA	NA	Spain	0,000	0,000	0,000	0,000	0,000	0,000	0,583	0,000	0,000	0,417	0,000	0,000	0,000	0,000
Sweden	Iceland	Czech Rep	Japan	NA	NA	Sweden	0,340	0,000	0,000	0,000	0,191	0,000	0,469	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	NA	UK	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Slovenia	Estonia	Israel	Chile	NA	Austria	0,000	0,000	0,213	0,000	0,000	0,091	0,000	0,000	0,000	0,678	0,000	0,000	0,000	0,018
Belgium	Slovenia	Japan	Poland	Korea	Chile	Belgiur	0,000	0,000	0,148	0,000	0,000	0,000	0,340	0,000	0,161	0,000	0,234	0,000	0,000	0,117
Czech Rep,	Czech Rep	NA	NA	NA	NA	Czech I	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Slovenia	Japan	Israel	Chile	NA	France	0,000	0,000	0,050	0,000	0,000	0,000	0,377	0,000	0,000	0,504	0,000	0,000	0,000	0,070
Germany	Slovenia	Japan	Israel	Chile	NA	Germany	0,000	0,000	0,509	0,000	0,000	0,000	0,083	0,000	0,000	0,318	0,000	0,000	0,000	0,090
Hungary	Estonia	Chile	NA	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,524	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,476
Japan	Japan	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	NA	Luxembo	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Netherland	UK	Japan	Poland	Turkey	NA	Nether	0,000	0,000	0,000	0,271	0,000	0,000	0,533	0,000	0,184	0,000	0,000	0,011	0,000	0,000
Poland	Poland	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Estonia	Mexico	Chile	NA	NA	Slovak	0,000	0,000	0,000	0,000	0,000	0,529	0,000	0,000	0,000	0,000	0,000	0,000	0,228	0,243
Israel	Israel	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Chile	NA	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,653	0,000	0,000	0,000	0,000	0,000	0,000	0,347
Korea	Korea	NA	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Israel	NA	NA	NA	Switzer	0,000	0,000	0,000	0,000	0,000	0,000	0,750	0,000	0,000	0,250	0,000	0,000	0,000	0,000
US	Korea	Chile	NA	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,298	0,000	0,000	0,702

2011	peer1	peer2	peer3	peer4	peer5		Greece	Iceland	Portugal	Slovenia	Spain	UK	Czech Rep,	Estonia	Japan	Luxembo	Poland	Israel	Korea	Turkey	Mexico	Chile	Switzerl
Australia	Japan	Israel	Korea	Chile	NA	Australi	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,489	0,000	0,000	0,346	0,134	0,000	0,000	0,032	0,000
Denmark	Estonia	Japan	Poland	NA	NA	Denmar	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,294	0,580	0,000	0,126	0,000	0,000	0,000	0,000	0,000	0,000
Finland	Iceland	Slovenia	Japan	Luxembo	NA	Finland	0,000	0,164	0,000	0,733	0,000	0,000	0,000	0,000	0,012	0,091	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	NA	Greece	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	NA	Iceland	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Korea	Chile	NA	NA	Ireland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,058	0,000	0,000	0,000	0,913	0,000	0,000	0,029	0,000
Italy	UK	Japan	Israel	NA	NA	Italy	0,000	0,000	0,000	0,000	0,000	0,005	0,000	0,000	0,604	0,000	0,000	0,391	0,000	0,000	0,000	0,000	0,000
New Zealanc	Estonia	Japan	Turkey	Chile	NA	New Zea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,005	0,712	0,000	0,000	0,000	0,000	0,131	0,000	0,152	0,000
Norway	Iceland	Estonia	Japan	Luxembo	NA	Norway	0,000	0,262	0,000	0,000	0,000	0,000	0,000	0,161	0,449	0,128	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	NA	Portuga	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	NA	Sloven	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	NA	Spain	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Sweden	Iceland	UK	Czech Rep	Japan	NA	Sweden	0,000	0,562	0,000	0,000	0,000	0,163	0,096	0,000	0,236	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	NA	UK	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Greece	Portugal	Estonia	Japan	Chile	Austri	0,100	0,000	0,330	0,000	0,000	0,000	0,000	0,055	0,422	0,000	0,000	0,000	0,000	0,000	0,000	0,093	0,000
Belgium	Slovenia	Japan	Poland	Korea	Chile	Belgiur	0,000	0,000	0,000	0,144	0,000	0,000	0,000	0,000	0,305	0,000	0,115	0,000	0,373	0,000	0,000	0,166	0,000
Czech Rep,	Czech Rep	NA	NA	NA	NA	Czech F	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Spain	Japan	Chile	NA	France	0,000	0,000	0,047	0,000	0,360	0,000	0,000	0,000	0,502	0,000	0,000	0,000	0,000	0,000	0,000	0,092	0,000
Germany	Portugal	Slovenia	Japan	Chile	NA	Germany	0,000	0,000	0,213	0,350	0,000	0,000	0,000	0,000	0,301	0,000	0,000	0,000	0,000	0,000	0,000	0,136	0,000
Hungary	Poland	Chile	NA	NA	NA	Hungar	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,719	0,000	0,000	0,000	0,000	0,281	0,000
Japan	Japan	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	NA	Luxembo	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Netherland	UK	Japan	Poland	Turkey	NA	Nether	0,000	0,000	0,000	0,000	0,000	0,367	0,000	0,000	0,502	0,000	0,127	0,000	0,000	0,003	0,000	0,000	0,000
Poland	Poland	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Estonia	Poland	Turkey	Mexico	NA	Slovak	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,117	0,000	0,000	0,643	0,000	0,000	0,019	0,238	0,000	0,000
Israel	Israel	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Canada	Japan	Chile	NA	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,700	0,000	0,000	0,000	0,000	0,000	0,000	0,300	0,000
Korea	Korea	NA	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Chile	Chile	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Switzerlan	Switzerlar	NA	NA	NA	NA	Switzer	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
US	Korea	Chile	NA	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,319	0,000	0,000	0,681	0,000

2012	peer1	peer2	peer3	peer4	peer5		Greece	Iceland	Portugal	Slovenia	Spain	UK	Czech Rep,	Estonia	Hungary	Japan	Luxembo	Poland	Israel	Korea	Turkey	Mexico	Chile
Australia	Spain	Japan	Korea	Chile	NA	Australi	0,000	0,000	0,000	0,000	0,239	0,000	0,000	0,000	0,000	0,353	0,000	0,000	0,000	0,348	0,000	0,000	0,060
Denmark	UK	Estonia	Japan	Poland	NA	Denmar	0,000	0,000	0,000	0,000	0,000	0,131	0,000	0,281	0,000	0,440	0,000	0,147	0,000	0,000	0,000	0,000	0,000
Finland	Iceland	Slovenia	Japan	Luxembou	NA	Finland	0,000	0,285	0,000	0,493	0,000	0,000	0,000	0,000	0,000	0,142	0,080	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	NA	Greece	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	NA	Iceland	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Korea	Chile	NA	NA	Ireland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,125	0,000	0,000	0,000	0,812	0,000	0,000	0,063
Italy	Czech Rep	Japan	Israel	NA	NA	Italy	0,000	0,000	0,000	0,000	0,000	0,000	0,083	0,000	0,000	0,571	0,000	0,000	0,345	0,000	0,000	0,000	0,000
New Zealanc	Greece	Japan	Turkey	Chile	NA	New Zea	0,098	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,637	0,000	0,000	0,000	0,000	0,137	0,000	0,129
Norway	Iceland	Estonia	Japan	Luxembou	NA	Norway	0,000	0,134	0,000	0,000	0,000	0,000	0,000	0,228	0,000	0,554	0,084	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	NA	Portug	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	NA	Sloven	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	NA	Spain	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Sweden	Iceland	Slovenia	Estonia	Japan	NA	Sweden	0,000	0,202	0,000	0,001	0,000	0,000	0,000	0,202	0,000	0,594	0,000	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	NA	UK	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Greece	Slovenia	Japan	Poland	Chile	Austri	0,208	0,000	0,000	0,333	0,000	0,000	0,000	0,000	0,000	0,322	0,000	0,036	0,000	0,000	0,000	0,000	0,162
Belgium	Japan	Poland	Korea	Chile	NA	Belgiur	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,430	0,000	0,182	0,000	0,269	0,000	0,000	0,119
Czech Rep,	Czech Rep	NA	NA	NA	NA	Czech I	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	Estoni	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Portugal	Spain	Japan	Chile	NA	France	0,000	0,000	0,088	0,000	0,295	0,000	0,000	0,000	0,000	0,471	0,000	0,000	0,000	0,000	0,000	0,000	0,146
Germany	Portugal	Slovenia	Japan	Chile	NA	Germany	0,000	0,000	0,214	0,319	0,000	0,000	0,000	0,000	0,000	0,319	0,000	0,000	0,000	0,000	0,000	0,000	0,148
Hungary	Hungary	Mexico	NA	NA	NA	Hungar	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Japan	Japan	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	NA	Luxemb	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Netherland	UK	Japan	Poland	Turkey	NA	Nether	0,000	0,000	0,000	0,000	0,000	0,450	0,000	0,000	0,000	0,390	0,000	0,158	0,000	0,000	0,002	0,000	0,000
Poland	Poland	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Rep	Hungary	Poland	Mexico	NA	NA	Slovak	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,017	0,000	0,000	0,725	0,000	0,000	0,000	0,258	0,000
Israel	Israel	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Japan	Chile	NA	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,644	0,000	0,000	0,000	0,000	0,000	0,000	0,356
Korea	Korea	NA	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Japan	Israel	Korea	NA	NA	Switzer	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,728	0,000	0,000	0,233	0,039	0,000	0,000	0,000
US	Korea	Chile	NA	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,313	0,000	0,000	0,688

2013	peer1	peer2	peer3	peer4	peer5	peer6		Greece	Iceland	Italy	Slovenia	Spain	UK	Czech Rep,	Estonia	Japan	Luxembo	Poland	Korea	Turkey	Mexico	Chile
Australia	Spain	Japan	Korea	Chile	NA	NA	Australia	0,000	0,000	0,000	0,000	0,162	0,000	0,000	0,000	0,293	0,000	0,000	0,446	0,000	0,000	0,099
Denmark	UK	Estonia	Japan	Poland	Turkey	NA	Denmark	0,000	0,000	0,000	0,000	0,000	0,076	0,000	0,243	0,468	0,000	0,209	0,000	0,003	0,000	0,000
Finland	Iceland	Slovenia	Japan	Luxembou	NA	NA	Finland	0,000	0,234	0,000	0,527	0,000	0,000	0,000	0,000	0,172	0,067	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	NA	NA	Greece	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	NA	NA	Iceland	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Korea	Chile	NA	NA	NA	Ireland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,164	0,000	0,000	0,787	0,000	0,000	0,049
Italy	Italy	NA	NA	NA	NA	NA	Italy	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
New Zealand	Greece	Slovenia	Spain	Japan	Turkey	32,000	New Zea	0,027	0,000	0,000	0,099	0,058	0,000	0,000	0,000	0,561	0,000	0,000	0,000	0,212	0,000	0,043
Norway	Iceland	Czech Rep	Estonia	Japan	NA	NA	Norway	0,000	0,285	0,000	0,000	0,000	0,000	0,025	0,181	0,509	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Greece	Slovenia	Poland	Chile	NA	NA	Portuga	0,447	0,000	0,000	0,525	0,000	0,000	0,000	0,000	0,000	0,000	0,002	0,000	0,000	0,000	0,026
Slovenia	Slovenia	NA	NA	NA	NA	NA	Sloveni	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	NA	NA	Spain	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Sweden	Greece	Slovenia	Estonia	Japan	NA	NA	Sweden	0,006	0,000	0,000	0,119	0,000	0,000	0,000	0,169	0,706	0,000	0,000	0,000	0,000	0,000	0,000
UK	UK	NA	NA	NA	NA	NA	UK	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Greece	Slovenia	Japan	Turkey	Chile	NA	Austria	0,189	0,000	0,000	0,474	0,000	0,000	0,000	0,000	0,275	0,000	0,000	0,000	0,053	0,000	0,009
Belgium	Japan	Poland	Korea	Chile	NA	NA	Belgium	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,571	0,000	0,128	0,134	0,000	0,000	0,192
Czech Rep,	Czech Rep	NA	NA	NA	NA	NA	Czech R	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Greece	Spain	Japan	Turkey	Chile	NA	France	0,061	0,000	0,000	0,000	0,189	0,000	0,000	0,000	0,545	0,000	0,000	0,000	0,000	0,000	0,204
Germany	Slovenia	Spain	Japan	Chile	NA	NA	Germany	0,000	0,000	0,000	0,592	0,166	0,000	0,000	0,000	0,092	0,000	0,000	0,000	0,000	0,000	0,150
Hungary	Poland	Chile	NA	NA	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,688	0,000	0,000	0,000	0,313
Japan	Japan	NA	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	NA	NA	Luxembo	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Netherland	UK	Estonia	Japan	Poland	NA	NA	Nether	0,000	0,000	0,000	0,000	0,000	0,513	0,000	0,044	0,356	0,000	0,088	0,000	0,000	0,000	0,000
Poland	Poland	NA	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Slovak Rep	Estonia	Poland	Turkey	Mexico	NA	NA	Slovak	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,205	0,000	0,000	0,494	0,000	0,056	0,245	0,000
Israel	Spain	Korea	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,214	0,000	0,000	0,000	0,000	0,000	0,000	0,786	0,000	0,000	0,000
Canada	Japan	Chile	NA	NA	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,652	0,000	0,000	0,000	0,000	0,000	0,348
Korea	Korea	NA	NA	NA	NA	NA	Korea	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerlan	Spain	Japan	Korea	Chile	NA	NA	Switzer	0,000	0,000	0,000	0,000	0,090	0,000	0,000	0,000	0,622	0,000	0,000	0,281	0,000	0,000	0,007
US	Korea	Chile	NA	NA	NA	NA	US	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,319	0,000	0,000	0,681

2014	peer1	peer2	peer3	peer4	peer5		Finland	Greece	Iceland	Slovenia	Spain	United K	Czech Re	Estonia	Japan	Luxembo	Poland	Israel	Korea, R	Turkey	Mexico	Chile
Australia	Greece	Slovenia	Japan	Korea, Re	Chile	Australia	0,000	0,028	0,000	0,131	0,000	0,000	0,000	0,000	0,272	0,000	0,000	0,000	0,440	0,000	0,000	0,129
Denmark	United Kir	Estonia	Japan	Poland	Turkey	Denmark	0,000	0,000	0,000	0,000	0,000	0,027	0,000	0,266	0,505	0,000	0,184	0,000	0,000	0,018	0,000	0,000
Finland	Finland	NA	NA	NA	NA	Finland	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	NA	Greece	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	NA	Iceland	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Japan	Korea, Re	Turkey	NA	NA	Ireland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,311	0,000	0,000	0,000	0,656	0,033	0,000	0,000
Italy	Spain	Estonia	Japan	Chile	NA	Italy	0,000	0,000	0,000	0,000	0,542	0,000	0,000	0,101	0,357	0,000	0,000	0,000	0,000	0,000	0,000	0,000
New Zealand	Czech Rep	Japan	Turkey	Chile	NA	New Zea	0,000	0,000	0,000	0,000	0,000	0,000	0,182	0,000	0,541	0,000	0,000	0,000	0,000	0,105	0,000	0,172
Norway	Iceland	Estonia	Japan	Luxembou	NA	Norway	0,000	0,000	0,155	0,000	0,000	0,000	0,000	0,228	0,514	0,103	0,000	0,000	0,000	0,000	0,000	0,000
Portugal	Greece	Slovenia	Estonia	Chile	NA	Portugal	0,000	0,432	0,000	0,493	0,000	0,000	0,000	0,047	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,028
Slovenia	Slovenia	NA	NA	NA	NA	Slovenia	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	NA	Spain	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Sweden	Greece	Slovenia	Estonia	Japan	NA	Sweden	0,000	0,068	0,000	0,059	0,000	0,000	0,000	0,210	0,663	0,000	0,000	0,000	0,000	0,000	0,000	0,000
United Kingd	United Kir	NA	NA	NA	NA	United K	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Austria	Greece	Slovenia	Estonia	Japan	Chile	Austria	0,000	0,179	0,000	0,333	0,000	0,000	0,000	0,097	0,287	0,000	0,000	0,000	0,000	0,000	0,000	0,104
Belgium	Japan	Poland	Korea, Re	Chile	NA	Belgium	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,655	0,000	0,025	0,000	0,089	0,000	0,000	0,231
Czech Repub	Czech Rep	NA	NA	NA	NA	Czech Re	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	NA	NA	Estonia	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
France	Greece	Slovenia	Estonia	Japan	Chile	France	0,000	0,096	0,000	0,064	0,000	0,000	0,000	0,041	0,542	0,000	0,000	0,000	0,000	0,000	0,000	0,258
Germany	Greece	Slovenia	Estonia	Japan	Chile	Germany	0,000	0,009	0,000	0,685	0,000	0,000	0,000	0,040	0,078	0,000	0,000	0,000	0,000	0,000	0,000	0,188
Hungary	Poland	Mexico	Chile	NA	NA	Hungary	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,742	0,000	0,000	0,000	0,018	0,240
Japan	Japan	NA	NA	NA	NA	Japan	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Luxembourg	Luxembou	NA	NA	NA	NA	Luxembo	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Netherlands	United Kir	Estonia	Japan	Poland	NA	Netherla	0,000	0,000	0,000	0,000	0,000	0,488	0,000	0,042	0,344	0,000	0,126	0,000	0,000	0,000	0,000	0,000
Poland	Poland	NA	NA	NA	NA	Poland	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Slovak Repul	Poland	Turkey	Mexico	NA	NA	Slovak R	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,739	0,000	0,000	0,117	0,143	0,000
Israel	Israel	NA	NA	NA	NA	Israel	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Canada	Korea, Re	Turkey	Chile	NA	NA	Canada	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,709	0,006	0,000	0,285
Korea, Rep,	Korea, Re	NA	NA	NA	NA	Korea, R	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Turkey	Turkey	NA	NA	NA	NA	Turkey	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Mexico	Mexico	NA	NA	NA	NA	Mexico	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Chile	Chile	NA	NA	NA	NA	Chile	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Switzerland	Greece	Slovenia	Japan	Korea, Re	Chile	Switzerl	0,000	0,048	0,000	0,025	0,000	0,000	0,000	0,000	0,609	0,000	0,000	0,000	0,136	0,000	0,000	0,183
United State	Korea, Re	Turkey	NA	NA	NA	United S	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,710	0,290	0,000	0,000

AP. 3. WITHIN EFFICIENCY – CALCULATED PEERS and GHTS LES for all select

2000	peer1	peer2	peer3	Australia	Finland	Greece	Iceland	Italy	New Zeala	Portugal	Slovenia	Spain	Sweden	United Kin
Australia	Australia	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Slovenia	Sweden	United Kir	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,433	0,000	0,209	0,357
Finland	Finland	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	Sweden	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Slovenia	United Kir	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,713	0,000	0,000	0,287
Italy	Italy	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeal	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Norway	Finland	Sweden	United Kir	0,000	0,175	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,519	0,306
Portugal	Portugal	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Spain	Spain	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Sweden	Sweden	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
United Kir	United Kir	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Poland	Slovak Repul	Israel					
Austria	Czech Rep	Japan	NA	0,476	0,000	0,524	0,000	0,000	0,000					
Belgium	Czech Rep	Japan	Poland	0,168	0,000	0,669	0,224	0,000	0,000					
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000					
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000					
France	Czech Rep	Japan	Poland	0,214	0,000	0,692	0,094	0,000	0,000					
Germany	Czech Rep	Japan	NA	0,429	0,000	0,571	0,000	0,000	0,000					
Hungary	Estonia	Poland	NA	0,000	0,119	0,000	0,881	0,000	0,000					
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000					
Luxembou	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000					
Netherlan	Japan	Poland	NA	0,000	0,000	0,720	0,280	0,000	0,000					
Poland	Poland	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000					
Slovak Rep	Slovak Rep	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000					
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000					
	peer1	Canada	Korea	Turkey	Mexico									
Canada	Canada	1,000	0,000	0,000	0,000									
Korea	Korea	0,000	1,000	0,000	0,000									
Turkey	Turkey	0,000	0,000	1,000	0,000									
Mexico	Mexico	0,000	0,000	0,000	1,000									
	peer1	peer2	Chile	Switzerland										
Chile	Chile	NA	1,000	0,000										
Switzerlar	Switzerlar	NA	0,000	1,000										
US	Chile	Switzerlar	0,528	0,472										

2001	peer1	peer2	peer3	peer4	Australia	Finland	Greece	Iceland	New Zeala	Portugal	Slovenia	Spain	Sweden	United Kin
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Slovenia	Sweden	United Kir	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,283	0,000	0,244	0,474
Finland	Finland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	Spain	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	New Zeala	Slovenia	United Kir	NA	0,000	0,000	0,000	0,000	0,139	0,000	0,594	0,000	0,000	0,267
Italy	Finland	Iceland	Spain	NA	0,000	0,016	0,000	0,426	0,000	0,000	0,000	0,557	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Norway	Finland	Slovenia	Sweden	United Kir	0,000	0,007	0,000	0,000	0,000	0,000	0,203	0,000	0,627	0,164
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Sweden	Sweden	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Poland	Slovak Repul	Israel					
Austria	Czech Rep	Japan	Poland	0,326	0,000	0,567	0,169	0,000	0,000					
Belgium	Czech Rep	Japan	Poland	0,069	0,000	0,672	0,260	0,000	0,000					
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000					
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000					
France	Czech Rep	Japan	Poland	0,185	0,000	0,671	0,144	0,000	0,000					
Germany	Czech Rep	Japan	NA	0,474	0,000	0,526	0,000	0,000	0,000					
Hungary	Estonia	Poland	NA	0,000	0,060	0,000	0,940	0,000	0,000					
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000					
Luxembou	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000					
Netherlan	Japan	Poland	NA	0,000	0,000	0,722	0,278	0,000	0,000					
Poland	Poland	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000					
Slovak Rep	Slovak Re	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000					
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000					
	peer1	Canada	Korea	Turkey	Mexico									
Canada	Canada	1,000	0,000	0,000	0,000									
Korea	Korea	0,000	1,000	0,000	0,000									
Turkey	Turkey	0,000	0,000	1,000	0,000									
Mexico	Mexico	0,000	0,000	0,000	1,000									
	peer1	peer2	Chile	Switzerland										
Chile	Chile	NA	1,000	0,000										
Switzerlar	Switzerlar	NA	0,000	1,000										
US	Chile	Switzerlar	0,574	0,426										

2002	peer1	peer2	peer3	peer4	Australia	Finland	Greece	Iceland	Italy	New Zealanc	Portugal	Slovenia	Spain	Sweden	United Kingd
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Slovenia	Sweden	United Kir	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,319	0,000	0,216	0,474
Finland	Finland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	New Zeala	Slovenia	United Kir	NA	0,000	0,000	0,000	0,000	0,000	0,585	0,000	0,161	0,000	0,000	0,254
Italy	Italy	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Norway	Finland	Iceland	Sweden	United Kir	0,000	0,405	0,000	0,162	0,000	0,000	0,000	0,000	0,000	0,205	0,228
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Sweden	Sweden	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Poland	Slovak Repul	Israel						
Austria	Czech Rep	Japan	Poland	0,308	0,000	0,549	0,143	0,000	0,000						
Belgium	Czech Rep	Japan	Poland	0,010	0,000	0,692	0,298	0,000	0,000						
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000						
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000						
France	Czech Rep	Japan	Poland	0,225	0,000	0,642	0,133	0,000	0,000						
Germany	Czech Rep	Japan	Poland	0,442	0,000	0,521	0,037	0,000	0,000						
Hungary	Poland	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000						
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000						
Luxembou	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000						
Netherlan	Japan	Poland	NA	0,000	0,000	0,760	0,240	0,000	0,000						
Poland	Poland	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000						
Slovak Re	Slovak Re	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000						
	peer1	Canada	Korea	Turkey	Mexico										
Canada	Canada	1,000	0,000	0,000	0,000										
Korea	Korea	0,000	1,000	0,000	0,000										
Turkey	Turkey	0,000	0,000	1,000	0,000										
Mexico	Mexico	0,000	0,000	0,000	1,000										
	peer1	peer2	Chile	Switzerland											
Chile	Chile	NA	1,000	0,000											
Switzerlar	Switzerlar	NA	0,000	1,000											
US	Chile	Switzerlar	0,628	0,372											

2003	peer1	peer2	peer3	peer4	Australia	Finland	Greece	Iceland	Italy	New Zealanc	Portugal	Slovenia	Spain	Sweden	United Kingd
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Slovenia	Sweden	United Kir	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,276	0,000	0,232	0,491
Finland	Finland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	New Zeala	Slovenia	United Kir	NA	0,000	0,000	0,000	0,000	0,000	0,407	0,000	0,278	0,000	0,000	0,315
Italy	Italy	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Norway	Finland	Iceland	New Zeala	Sweden	0,000	0,380	0,000	0,258	0,000	0,197	0,000	0,000	0,000	0,165	0,000
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Sweden	Sweden	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Poland	Slovak Repul	Israel						
Austria	Czech Rep	Japan	Poland	0,287	0,000	0,539	0,174	0,000	0,000						
Belgium	Japan	Poland	NA	0,000	0,000	0,736	0,264	0,000	0,000						
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000						
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000						
France	Czech Rep	Japan	Poland	0,293	0,000	0,609	0,098	0,000	0,000						
Germany	Czech Rep	Japan	Poland	0,389	0,000	0,528	0,082	0,000	0,000						
Hungary	Poland	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000						
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000						
Luxembou	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000						
Netherlan	Japan	Poland	NA	0,000	0,000	0,842	0,158	0,000	0,000						
Poland	Poland	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000						
Slovak Rep	Slovak Rep	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000						
	peer1	Canada	Korea	Turkey	Mexico										
Canada	Canada	1,000	0,000	0,000	0,000										
Korea	Korea	0,000	1,000	0,000	0,000										
Turkey	Turkey	0,000	0,000	1,000	0,000										
Mexico	Mexico	0,000	0,000	0,000	1,000										
	peer1	peer2	Chile	Switzerland											
Chile	Chile	NA	1,000	0,000											
Switzerlar	Switzerlar	NA	0,000	1,000											
US	Chile	Switzerlar	0,667	0,333											

2004	peer1	peer2	peer3	peer4	Australia	Finland	Greece	Iceland	Italy	New Zealanc	Portugal	Slovenia	Spain	Sweden	United Kingd
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Slovenia	Sweden	United Kir	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,457	0,000	0,112	0,432
Finland	Finland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Finland	New Zeala	Slovenia	NA	0,000	0,081	0,000	0,000	0,000	0,522	0,000	0,396	0,000	0,000	0,000
Italy	Italy	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Norway	Finland	Iceland	New Zeala	Sweden	0,000	0,300	0,000	0,344	0,000	0,193	0,000	0,000	0,000	0,164	0,000
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Sweden	Sweden	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Luxembou	Poland	Israel						
Austria	Czech Rep	Japan	Poland	0,230	0,000	0,582	0,000	0,188	0,000						
Belgium	Czech Rep	Japan	Poland	0,049	0,000	0,663	0,000	0,287	0,000						
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000						
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000						
France	Czech Rep	Japan	Poland	0,097	0,000	0,738	0,000	0,166	0,000						
Germany	Czech Rep	Japan	Poland	0,315	0,000	0,558	0,000	0,127	0,000						
Hungary	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000						
Luxembou	Luxembou	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000						
Netherlan	Japan	Poland	NA	0,000	0,000	0,772	0,000	0,228	0,000						
Poland	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Slovak Rep	Czech Rep	Estonia	Poland	0,140	0,330	0,000	0,000	0,530	0,000						
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000						
	peer1	Canada	Korea	Turkey	Mexico										
Canada	Canada	1,000	0,000	0,000	0,000										
Korea	Korea	0,000	1,000	0,000	0,000										
Turkey	Turkey	0,000	0,000	1,000	0,000										
Mexico	Mexico	0,000	0,000	0,000	1,000										
	peer1	peer2	Chile	Switzerland											
Chile	Chile	NA	1,000	0,000											
Switzerlar	Switzerlar	NA	0,000	1,000											
US	Chile	Switzerlar	0,707	0,293											

2005	peer1	peer2	peer3	peer4	Australia	Finland	Greece	Iceland	Italy	New Zealanc	Portugal	Slovenia	Spain	Sweden	United Kingd
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Slovenia	Sweden	United Kir	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,417	0,000	0,163	0,420
Finland	Finland	New Zeala	Slovenia	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Finland	New Zeala	Slovenia	NA	0,000	0,297	0,000	0,000	0,000	0,456	0,000	0,247	0,000	0,000	0,000
Italy	Italy	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Norway	Finland	Iceland	New Zeala	Slovenia	0,000	0,128	0,000	0,537	0,000	0,178	0,000	0,157	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Sweden	Sweden	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Luxembou	Poland	Israel						
Austria	Czech Rep	Japan	Poland	0,147	0,000	0,602	0,000	0,251	0,000						
Belgium	Japan	Poland	NA	0,000	0,000	0,667	0,000	0,333	0,000						
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000						
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000						
France	Czech Rep	Japan	Poland	0,033	0,000	0,749	0,000	0,218	0,000						
Germany	Czech Rep	Japan	Poland	0,256	0,000	0,586	0,000	0,158	0,000						
Hungary	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000						
Luxembou	Luxembou	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000						
Netherlan	Japan	Poland	NA	0,000	0,000	0,638	0,000	0,362	0,000						
Poland	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Slovak Rep	Estonia	Poland	NA	0,000	0,253	0,000	0,000	0,747	0,000						
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000						
	peer1	Canada	Korea	Turkey	Mexico										
Canada	Canada	1,000	0,000	0,000	0,000										
Korea	Korea	0,000	1,000	0,000	0,000										
Turkey	Turkey	0,000	0,000	1,000	0,000										
Mexico	Mexico	0,000	0,000	0,000	1,000										
	peer1	peer2	Chile	Switzerland											
Chile	Chile	NA	1,000	0,000											
Switzerlar	Switzerlar	NA	0,000	1,000											
US	Chile	Switzerlar	0,725	0,275											

2006	peer1	peer2	peer3	peer4	Australia	Greece	Greece	Iceland	Italy	New Zealanc	Portugal	Slovenia	Spain	Sweden	United Kingd
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Iceland	Slovenia	United Kir	NA	0,000	0,000	0,000	0,118	0,000	0,000	0,000	0,446	0,000	0,000	0,436
Finland	Finland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	Italy	United Kir	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Finland	New Zeala	Slovenia	NA	0,000	0,237	0,000	0,000	0,000	0,398	0,000	0,366	0,000	0,000	0,000
Italy	Italy	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Norway	Australia	Finland	Iceland	New Zeala	0,020	0,208	0,000	0,550	0,000	0,223	0,000	0,000	0,000	0,000	0,000
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Sweden	Iceland	Sweden	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Luxembou	Poland	Israel						
Austria	Czech Rep	Japan	Poland	0,032	0,000	0,656	0,000	0,312	0,000						
Belgium	Czech Rep	Japan	Poland	0,015	0,000	0,642	0,000	0,347	0,000						
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000						
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000						
France	Japan	Poland	Israel	0,000	0,000	0,673	0,000	0,172	0,155						
Germany	Czech Rep	Japan	Poland	0,226	0,000	0,589	0,000	0,185	0,000						
Hungary	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000						
Luxembou	Luxembou	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000						
Netherlan	Czech Rep	Japan	Poland	0,035	0,000	0,641	0,000	0,324	0,000						
Poland	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Slovak Rep	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000						
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000						
	peer1	Canada	Korea	Turkey	Mexico										
Canada	Canada	1,000	0,000	0,000	0,000										
Korea	Korea	0,000	1,000	0,000	0,000										
Turkey	Turkey	0,000	0,000	1,000	0,000										
Mexico	Mexico	0,000	0,000	0,000	1,000										
	peer1	peer2	Chile	Switzerland											
Chile	Chile	NA	1,000	0,000											
Switzerlar	Switzerlar	NA	0,000	1,000											
US	Chile	Switzerlar	0,725	0,275											

2007	peer1	peer2	peer3	peer4	Australia	Finland	Greece	Iceland	Italy	New Zealanc	Portugal	Slovenia	Spain	United Kin
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Iceland	Slovenia	United Kir	NA	0,000	0,000	0,000	0,158	0,000	0,000	0,000	0,413	0,000	0,429
Finland	Finland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Finland	New Zeala	Slovenia	NA	0,000	0,513	0,000	0,000	0,000	0,367	0,000	0,121	0,000	0,000
Italy	Italy	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Norway	Finland	Iceland	New Zeala	Slovenia	0,000	0,218	0,000	0,515	0,000	0,185	0,000	0,082	0,000	0,000
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Sweden	Iceland	Italy	New Zeala	Slovenia	0,000	0,000	0,000	0,792	0,014	0,114	0,000	0,084	0,000	0,000
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Luxembou	Poland	Israel					
Austria	Japan	Poland	Israel	0,000	0,000	0,586	0,000	0,283	0,131					
Belgium	Czech Rep	Japan	Poland	0,008	0,000	0,623	0,000	0,369	0,000					
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000					
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000					
France	Japan	Poland	Israel	0,000	0,000	0,553	0,000	0,097	0,350					
Germany	Czech Rep	Japan	Poland	0,141	0,000	0,621	0,000	0,237	0,000					
Hungary	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000					
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000					
Luxembou	Luxembou	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000					
Netherlan	Japan	Poland	NA	0,000	0,000	0,697	0,000	0,303	0,000					
Poland	Poland	NA	NA	0,000	0,000	0,000	0,000	10,000	0,000					
Slovak Rep	Poland	NA	NA	0,000	0,000	0,000	0,000	10,000	0,000					
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000					
	peer1	Canada	Korea	Turkey	Mexico									
Canada	Canada	1,000	0,000	0,000	0,000									
Korea	Korea	0,000	1,000	0,000	0,000									
Turkey	Turkey	0,000	0,000	1,000	0,000									
Mexico	Mexico	0,000	0,000	0,000	1,000									
	peer1	peer2	Chile	Switzerland										
Chile	Chile	NA	1,000	0,000										
Switzerlar	Switzerlar	NA	0,000	1,000										
US	Chile	Switzerlar	0,732	0,268										

2008	peer1	peer2	peer3	peer4	Australia	Finland	Greece	Iceland	Italy	New Zealanc	Portugal	Slovenia	Spain	United Kin
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Iceland	Slovenia	United Kir	NA	0,000	0,000	0,000	0,095	0,000	0,000	0,000	0,512	0,000	0,393
Finland	Finland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Australia	Finland	New Zeala	NA	0,055	0,592	0,000	0,000	0,000	0,353	0,000	0,000	0,000	0,000
Italy	Italy	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Norway	Finland	Iceland	New Zeala	Slovenia	0,000	0,032	0,000	0,564	0,000	0,149	0,000	0,255	0,000	0,000
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Sweden	Iceland	Italy	Slovenia	United Kir	0,000	0,000	0,000	0,698	0,131	0,000	0,000	0,089	0,000	0,081
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000

	peer1	peer2	peer3	Czech Rep	Estonia	Japan	Luxembou	Poland	Israel
Austria	Japan	Poland	Israel	0,000	0,000	0,509	0,000	0,258	0,233
Belgium	Japan	Poland	NA	0,000	0,000	0,639	0,000	0,361	0,000
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000
France	Japan	Poland	Israel	0,000	0,000	0,540	0,000	0,117	0,344
Germany	Czech Rep	Japan	Poland	0,124	0,000	0,615	0,000	0,262	0,000
Hungary	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000
Japan	Japan	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000
Luxembou	Luxembou	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000
Netherlan	Czech Rep	Japan	Poland	0,040	0,000	0,676	0,000	0,283	0,000
Poland	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000
Slovak Rep	Poland	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000

	peer1	Canada	Korea	Turkey	Mexico
Canada	Canada	1,000	0,000	0,000	0,000
Korea	Korea	0,000	1,000	0,000	0,000
Turkey	Turkey	0,000	0,000	1,000	0,000
Mexico	Mexico	0,000	0,000	0,000	1,000

	peer1	peer2	Chile	Switzerland
Chile	Chile	NA	1,000	0,000
Switzerlar	Switzerlar	NA	0,000	1,000
US	Chile	Switzerlar	0,714	0,286

2009	peer1	peer2	peer3	peer4	Australia	Iceland	Italy	New Zealanc	Portugal	Slovenia	Spain	United Kingd
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Iceland	Slovenia	United Kir	NA	0,000	0,036	0,000	0,000	0,000	0,577	0,000	0,387
Finland	Australia	Iceland	Slovenia	NA	0,008	0,312	0,000	0,000	0,000	0,679	0,000	0,000
Greece	Portugal	Slovenia	Spain	NA	0,000	0,000	0,000	0,000	0,426	0,216	0,357	0,000
Iceland	Iceland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Australia	New Zeala	Slovenia	NA	0,387	0,000	0,000	0,078	0,000	0,535	0,000	0,000
Italy	Italy	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Norway	Iceland	New Zeala	Slovenia	United Kir	0,000	0,581	0,000	0,134	0,000	0,230	0,000	0,056
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Sweden	Iceland	Italy	Slovenia	United Kir	0,000	0,696	0,140	0,000	0,000	0,052	0,000	0,112
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	peer4	Czech Rep	Estonia	Japan	Luxembourg	Poland	Israel		
Austria	Estonia	Japan	Poland	Israel	0,000	0,206	0,230	0,000	0,026	0,538		
Belgium	Japan	Poland	NA	NA	0,000	0,000	0,592	0,000	0,408	0,000		
Czech Rep	Czech Rep	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000		
Estonia	Estonia	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000		
France	Japan	Poland	Israel	NA	0,000	0,000	0,479	0,000	0,128	0,393		
Germany	Estonia	Japan	Poland	Israel	0,000	0,194	0,473	0,000	0,123	0,213		
Hungary	Poland	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000		
Japan	Japan	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000		
Luxembou	Luxembou	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000		
Netherlan	Czech Rep	Japan	Poland	NA	0,147	0,000	0,659	0,000	0,194	0,000		
Poland	Poland	NA	NA	NA	0,000	0,000	0,000	0,000	10,000	0,000		
Slovak Rep	Poland	NA	NA	NA	0,000	0,000	0,000	0,000	10,000	0,000		
Israel	Israel	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000		
	peer1	Canada	Korea	Turkey	Mexico							
Canada	Canada	1,000	0,000	0,000	0,000							
Korea	Korea	0,000	1,000	0,000	0,000							
Turkey	Turkey	0,000	0,000	1,000	0,000							
Mexico	Mexico	0,000	0,000	0,000	1,000							
	peer1	peer2	Chile	Switzerland								
Chile	Chile	NA	1,000	0,000								
Switzerlar	Switzerlar	NA	0,000	1,000								
US	Chile	Switzerlar	0,690	0,310								

2010	peer1	peer2	peer3	peer4	Australia	Greece	Iceland	Italy	New Zeala	Portugal	Slovenia	Sweden	United Kingd
Australia	Australia	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Denmark	Iceland	Slovenia	United Kir	NA	0,000	0,000	0,105	0,000	0,000	0,000	0,484	0,000	0,416
Finland	Iceland	Slovenia	NA	NA	0,000	0,000	0,333	0,000	0,000	0,000	0,667	0,000	0,000
Greece	Greece	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	Italy	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Australia	New Zeala	Slovenia	NA	0,465	0,000	0,000	0,000	0,070	0,000	0,465	0,000	0,000
Italy	Italy	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Norway	Iceland	New Zeala	Slovenia	United Kir	0,000	0,000	0,564	0,000	0,056	0,000	0,251	0,000	0,130
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Spain	Sweden	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Sweden	Iceland	Slovenia	Sweden	United Kir	0,000	0,000	0,720	0,000	0,000	0,000	0,040	0,014	0,226
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	peer4	Czech Rep	Estonia	Japan	Luxembourg	Poland	Israel			
Austria	Estonia	Japan	Israel	NA	0,000	0,202	0,143	0,000	0,000	0,655			
Belgium	Japan	Poland	NA	NA	0,000	0,000	0,594	0,000	0,406	0,000			
Czech Rep	Czech Rep	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000			
Estonia	Estonia	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000			
France	Japan	Poland	Israel	NA	0,000	0,000	0,423	0,000	0,078	0,499			
Germany	Estonia	Japan	Poland	Israel	0,000	0,159	0,414	0,000	0,149	0,278			
Hungary	Poland	NA	NA	NA	0,000	0,000	0,000	0,000	10,000	0,000			
Japan	Japan	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000			
Luxembou	Luxembou	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000			
Netherlan	Estonia	Japan	Poland	NA	0,000	0,226	0,724	0,000	0,050	0,000			
Poland	Poland	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000			
Slovak Rep	Poland	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000			
Israel	Israel	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000			
	peer1	Canada	Korea	Turkey	Mexico								
Canada	Canada	1,000	0,000	0,000	0,000								
Korea	Korea	0,000	1,000	0,000	0,000								
Turkey	Turkey	0,000	0,000	1,000	0,000								
Mexico	Mexico	0,000	0,000	0,000	1,000								
	peer1	peer2	Chile	Switzerland									
Chile	Chile	NA	1,000	0,000									
Switzerlar	Switzerlar	NA	0,000	1,000									
US	Chile	Switzerlar	0,674	0,326									

2011	peer1	peer2	peer3	peer4	Iceland	Iceland	Ireland	New Zealanc	Portugal	Slovenia	Spain	United Kingd
Australia	Iceland	New Zeala	Spain	NA	0,000	0,571	0,000	0,304	0,000	0,000	0,125	0,000
Denmark	Iceland	Slovenia	United Kir	NA	0,000	0,146	0,000	0,000	0,000	0,371	0,000	0,483
Finland	Iceland	Slovenia	NA	NA	0,000	0,250	0,000	0,000	0,000	0,750	0,000	0,000
Iceland	Iceland	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Ireland	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Italy	Iceland	Slovenia	Spain	United Kir	0,000	0,268	0,000	0,000	0,000	0,040	0,601	0,091
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Norway	Iceland	Ireland	Slovenia	United Kir	0,000	0,483	0,027	0,000	0,000	0,301	0,000	0,189
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Sweden	Iceland	Slovenia	Spain	United Kir	0,000	0,683	0,000	0,000	0,000	0,080	0,013	0,227
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
	peer1	peer2	peer3	peer4	Czech Rep	Estonia	Japan	Luxembourg	Slovak Re	Israel		
Austria	Estonia	Japan	Israel	NA	0,000	0,145	0,171	0,000	0,000	0,684		
Belgium	Japan	Slovak Re	NA	NA	0,000	0,000	0,661	0,000	0,339	0,000		
Czech Rep	Czech Rep	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000		
Estonia	Estonia	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000		
France	Japan	Israel	NA	NA	0,000	0,000	0,500	0,000	0,000	0,500		
Germany	Estonia	Japan	Slovak Re	Israel	0,000	0,138	0,399	0,000	0,116	0,347		
Hungary	Slovak Re	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000		
Japan	Japan	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000		
Luxembou	Luxembou	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000		
Netherlan	Czech Rep	Estonia	Japan	NA	0,088	0,156	0,755	0,000	0,000	0,000		
Poland	Slovak Re	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000		
Slovak Re	Slovak Re	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000		
Israel	Israel	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000		
	peer1	Canada	Korea	Turkey	Mexico							
Canada	Canada	1,000	0,000	0,000	0,000							
Korea	Korea	0,000	1,000	0,000	0,000							
Turkey	Turkey	0,000	0,000	1,000	0,000							
Mexico	Mexico	0,000	0,000	0,000	1,000							
	peer1	peer2	Chile	Switzerland								
Chile	Chile	NA	1,000	0,000								
Switzerlar	Switzerlar	NA	0,000	1,000								
US	Chile	Switzerlar	0,651	0,349								

2012	peer1	peer2	peer3	peer4	Greece	Iceland	Ireland	New Zealanc	Portugal	Slovenia	Spain	United Kingd
Australia	Iceland	New Zeala	Slovenia	NA	0,000	0,643	0,000	0,100	0,000	0,257	0,000	0,000
Denmark	Iceland	Slovenia	United Kir	NA	0,000	0,228	0,000	0,000	0,000	0,226	0,000	0,546
Finland	Iceland	Slovenia	NA	NA	0,000	0,375	0,000	0,000	0,000	0,625	0,000	0,000
Greece	Greece	NA	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Iceland	Iceland	NA	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Ireland	Ireland	NA	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000	0,000
Italy	Greece	Iceland	Spain	United Kir	0,064	0,316	0,000	0,000	0,000	0,000	0,465	0,160
New Zeala	New Zeala	NA	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Norway	Iceland	Slovenia	United Kir	NA	0,000	0,450	0,000	0,000	0,000	0,351	0,000	0,200
Portugal	Portugal	NA	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Slovenia	Slovenia	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Spain	Spain	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Sweden	Iceland	Slovenia	United Kir	NA	0,000	0,575	0,000	0,000	0,000	0,170	0,000	0,255
United Kir	United Kir	NA	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000

	peer1	peer2	peer3	Czech Rep	Estonia	Slovak Repul	Japan	Luxembourg	Poland	Israel
Austria	Japan	Poland	Israel	0,000	0,000	0,000	0,457	0,000	0,294	0,249
Belgium	Japan	Poland	NA	0,000	0,000	0,000	0,571	0,000	0,429	0,000
Czech Rep	Czech Rep	NA	NA	1,000	0,000	0,000	0,000	0,000	0,000	0,000
Estonia	Estonia	NA	NA	0,000	1,000	0,000	0,000	0,000	0,000	0,000
France	Japan	Poland	Israel	0,000	0,000	0,000	0,396	0,000	0,052	0,552
Germany	Japan	Poland	Israel	0,000	0,000	0,000	0,457	0,000	0,294	0,249
Hungary	Slovak Rep	NA	NA	0,000	0,000	1,000	0,000	0,000	0,000	0,000
Japan	Japan	NA	NA	0,000	0,000	0,000	1,000	0,000	0,000	0,000
Luxembou	Luxembou	NA	NA	0,000	0,000	0,000	0,000	1,000	0,000	0,000
Netherlan	Czech Rep	Estonia	Japan	0,022	0,282	0,000	0,696	0,000	0,000	0,000
Poland	Poland	NA	NA	0,000	0,000	0,000	0,000	0,000	1,000	0,000
Slovak Rep	Slovak Rep	Poland	NA	0,000	0,000	0,298	0,000	0,000	0,702	0,000
Israel	Israel	NA	NA	0,000	0,000	0,000	0,000	0,000	0,000	1,000

	peer1	Canada	Korea	Turkey	Mexico
Canada	Canada	1,000	0,000	0,000	0,000
Korea	Korea	0,000	1,000	0,000	0,000
Turkey	Turkey	0,000	0,000	1,000	0,000
Mexico	Mexico	0,000	0,000	0,000	1,000

	peer1	Chile	Switzerlar	US
Chile	Chile	1,000	0,000	0,000
Switzerlar	Switzerlar	0,000	1,000	0,000
US	US	0,000	0,000	1,000

2013	peer1	peer2	peer3	peer4	peer5	Greece	Iceland	Ireland	Italy	New Zealand	Portugal	Slovenia	Spain	United King
Australia	Ireland	New Zealan	Spain	NA	NA	0.000	0.000	0.460	0.000	0.019	0.000	0.000	0.521	0.000
Denmark	Iceland	Slovenia	United King	NA	NA	0.000	0.161	0.000	0.000	0.000	0.000	0.353	0.000	0.541
Finland	Iceland	Ireland	Slovenia	NA	NA	0.000	0.384	0.068	0.000	0.000	0.000	0.548	0.000	0.000
Greece	Greece	NA	NA	NA	NA	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Iceland	Iceland	NA	NA	NA	NA	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ireland	Ireland	NA	NA	NA	NA	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
Italy	Italy	NA	NA	NA	NA	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
New Zealan	New Zealan	NA	NA	NA	NA	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
Norway	Iceland	Ireland	Spain	United King	NA	0.000	0.692	0.085	0.000	0.000	0.000	0.000	0.004	0.219
Portugal	Portugal	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
Slovenia	Slovenia	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000
Spain	Spain	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000
Sweden	Iceland	Italy	Slovenia	Spain	United King	0.000	0.498	0.000	0.193	0.000	0.000	0.089	0.065	0.154
United King	United King	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000

	peer1	peer2	peer3	Czech Repul	Estonia	Hungary	Israel	Japan	Luxembourg	Poland
Austria	Israel	Japan	Poland	0.000	0.000	0.000	0.238	0.462	0.000	0.300
Belgium	Japan	Poland	NA	0.000	0.000	0.000	0.000	0.571	0.000	0.429
Czech Repul	Czech Repu	NA	NA	1.000	0.000	0.000	0.000	0.000	0.000	0.000
Estonia	Estonia	NA	NA	0.000	1.000	0.000	0.000	0.000	0.000	0.000
France	Israel	Japan	Poland	0.000	0.000	0.000	0.434	0.481	0.000	0.085
Germany	Israel	Japan	Poland	0.000	0.000	0.000	0.106	0.519	0.000	0.375
Hungary	Hungary	NA	NA	0.000	0.000	1.000	0.000	0.000	0.000	0.000
Japan	Japan	NA	NA	0.000	0.000	0.000	0.000	1.000	0.000	0.000
Luxembourg	Luxembour	NA	NA	0.000	0.000	0.000	0.000	0.000	1.000	0.000
Netherlands	Czech Repu	Japan	Poland	0.293	0.000	0.000	0.000	0.627	0.000	0.080
Poland	Poland	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Slovak Repu	Hungary	Poland	NA	0.000	0.000	0.082	0.000	0.000	0.000	0.918
Israel	Israel	NA	NA	0.000	0.000	0.000	1.000	0.000	0.000	0.000

	peer1	Korea	Turkey	Mexico
Canada	Korea	1.000	0.000	0.000
Korea	Korea	1.000	0.000	0.000
Turkey	Turkey	0.000	1.000	0.000
Mexico	Mexico	0.000	0.000	1.000

	peer1	Chile	Switzerland	US
Chile	Chile	1.000	0.000	0.000
Switzerland	Switzerland	0.000	1.000	0.000
US	US	0.000	0.000	1.000

AP. 4. İNGİLİZCE, ALMANCA VE FRANSIZCA KARŞILIKLAR

HACETTEPE ÜNİVERSİTESİ

İngilizce	Hacettepe University
Almanca	Hacettepe Universität
Fransızca	Universite dé Hacettepe

SOSYAL BİLİMLER ENSTİTÜSÜ

İngilizce	Graduate School of Social Sciences
Almanca	Institut für Sozialwissenschaften
Fransızca	Institut des Sciences Sociales

YÜKSEK LİSANS TEZİ

İngilizce	Master’s Thesis
Almanca	Magisterarbeit
Fransızca	Thèse de Maîtrise

AP.5. Orijinallik Raporu

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
YÜKSEK LİSANS/DOKTORA TEZ ÇALIŞMASI ORJİNALLİK RAPORU

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
IKTISAT ANABİLİM DALI BAŞKANLIĞI'NA

Tarih: 20/01/2017

Tez Başlığı / Konusu: OECD Ülkeri Sağlık Sistemleri Performansı: Veri Zarflama Analizi

Yukarıda başlığı/konusu gösterilen tez çalışmamın a) Kapak sayfası, b) Giriş, c) Ana bölümler ve d) Sonuç kısımlarından oluşan toplam 76 sayfalık kısmına ilişkin, 21/11/2016 tarihinde şahsım/tez danışmanım tarafından Turnitin adlı intihal tespit programından aşağıda belirtilen filtrelemeler uygulanarak alınmış olan orijinallik raporuna göre, tezimin benzerlik oranı % 9 'dur.

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2- Kaynakça hariç
3- Alıntılar hariç/dâhil
4- 5 kelimeden daha az örtüşme içeren metin kısımları hariç

Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Çalışması Orjinallik Raporu Alınması ve Kullanılması Uygulama Esasları'nı inceledim ve bu Uygulama Esasları'nda belirtilen azami benzerlik oranlarına göre tez çalışmamın herhangi bir intihal içermediğini; aksinin tespit edileceği muhtemel durumda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.

Gereğini saygılarımla arz ederim.

Tarih ve İmza

19.01.2017

Adı Soyadı:	Elif Goksu Ozturk
Öğrenci No:	N14123684
Anabilim Dalı:	Iktisat
Programı:	Ingilizce Iktisat
Statüsü:	✓ Y.Lisans ☐ Doktora ☐ Bütünleşik Dr.

DANIŞMAN ONAYI

UYGUNDUR.

Doç. Dr. Zafer Galiskan

(Unvan, Ad Soyad, İmza)

HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
THESIS/DISSERTATION ORIGINALITY REPORT

HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
TO THE DEPARTMENT OF ECONOMICS

Date: 20/01/2017

Thesis Title / Topic: Health System Performance In Oecd Countrıes: Data Envelopment Analysıs

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I respectfully submit this for approval.

Date and Signature

Name Surname:	Elif Goksu Ozturk
Student No:	N14123684
Department:	Economics
Program:	Economics (Taught In English)
Status:	✓ Masters ☐ Ph.D. ☐ Integrated Ph.D.

19.01.2017

ADVISOR APPROVAL

APPROVED.

Assoc. Prof. Zafer Gokcekus
(Title, Name Surname, Signature)

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AP. 6. Etik Kurul ya da Muhafiyet İzni

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
TEZ ÇALIŞMASI ETİK KURUL İZİN MUAFİYETİ FORMU

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
IKTISAT ANABİLİM DALI BAŞKANLIĞI'NA

Tarih:18/11/2016

Tez Başlığı / Konusu: OECD Ülkeri Sağlık Sistemleri Performansı: Veri Zarflama Analizi

Yukarıda başlığı/konusu gösterilen tez çalışmam:

1. İnsan ve hayvan üzerinde deney niteliği taşımamaktadır,
2. Biyolojik materyal (kan, idrar vb. biyolojik sıvılar ve numuneler) kullanılmasını gerektirmemektedir.
3. Beden bütünlüğüne müdahale içermemektedir.
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Hacettepe Üniversitesi Etik Kurullar ve Komisyonlarının Yönergelerini inceledim ve bunlara göre tez çalışmamın yürütülebilmesi için herhangi bir Etik Kuruldan izin alınmasına gerek olmadığını; aksi durumda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.

Gereğini saygılarımla arz ederim.

Tarih ve İmza
19.01.2017

Adı Soyadı: Elif Göksu Öztürk
Öğrenci No: N14123684
Anabilim Dalı: İktisat
Programı: Ingilizce Iktisat (Tezli)
Statüsü: √ Y.Lisans ☐ Doktora ☐ Bütünleşik Dr.

DANIŞMAN GÖRÜŞÜ VE ONAYI

Doç. Dr. Fatih Çalışkan
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HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
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HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
ECONOMICS TO THE DEPARTMENT PRESIDENCY

Date: 18/11/2016

Thesis Title / Topic: Health System Performance In Oecd Countries: Data Envelopment Analysis ;

My thesis work related to the title/topic above:

1. Does not perform experimentation on animals or people.
2. Does not necessitate the use of biological material (blood, urine, biological fluids and samples, etc.).
3. Does not involve any interference of the body's integrity.
4. Is not based on observational and descriptive research (survey, measures/scales, data scanning, system-model development).

I declare, I have carefully read Hacettepe University's Ethics Regulations and the Commission's Guidelines, and in order to proceed with my thesis according to these regulations I do not have to get permission from the Ethics Board for anything; in any infringement of the regulations I accept all legal responsibility and I declare that all the information I have provided is true.

I respectfully submit this for approval.

Date and Signature

19.01.2017

Name Surname:	Elif Göksu Öztürk
Student No:	N14123684
Department:	Economics
Program:	Taught in English
Status:	√ Masters ☐ Ph.D. ☐ Integrated Ph.D.

ADVISER COMMENTS AND APPROVAL

Assoc. Prof. Zafer Gokalp

(Title, Name Surname, Signature)