Public-Private Partnerships Potentials
in European Health Care Systems[*]

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Abstract

Over the last decades, fiscal pressures coupled with ever-growing need to provide quality of health care services have triggered a demand for creating advanced health care financing models. The aim of the paper is to rank the European countries and analyse the reasons for the scarce implementation of public private partnerships in some of the observed European health care systems. The study distinguished three broad categories of ex-ante critical success factors and developed 16 indicators for their measurement. European countries were ranked using the Composite I-distance Indicator method. The results indicate large dissimilarities in potentials for the implementation of public private partnerships. Following the results, the study focuses on the Adria region countries (Serbia, Croatia and Slovenia) and discusses potentials for the implementation of public private partnerships in this region. The study adds to the growing body of knowledge related to the diversification of financing models in health care services.

Keywords

health care; financing; public private partnership; critical success factor; comparative study

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1. Introduction

Over the last decades, fiscal pressures coupled with ever-growing need to provide quality of health care services have triggered a demand for creating advanced health care financing models. Further development of new and refurbishment of the existing health care infrastructure has motivated governments worldwide to engage private entities in public-private consortia (Grimsey and Lewis, 2002). Through these arrangements, private sector delivers capital, essential innovations, technical and managerial expertise (Chou and Pramudawardhani, 2015). Public-private partnerships (PPPs) are long-lasting and complex contracts, developed in the context of high uncertainty (Cruz and Marques, 2013). These partnerships come in many forms, from partnering with corporations (e.g. pharmaceutical companies engaged in product development), non-governmental organizations (i.e. expertise centres), and philanthropic organizations (Galea and McKee, 2014). Some studies even find these partnerships as the most suitable organizational form for the provision of social infrastructure (Benkovic et al,. 2015).

PPPs in a health care sector have gained immense attention nowadays (Weihe, 2010; Campos, Norman and Jadad, 2011), as European countries try to expand this co-operations (Anderson, 2012). Potential benefits of PPPs are reflected through economic and social development, generation of new jobs, fostering innovation and healthcare infrastructure development (Roehrich et al., 2014). Public service financing and risk outsourcing enables policy makers to focus on planning and regulation rather than the implementation of projects (The World Bank, 2011). Private sector benefits from the stable long-lasting cooperation in development of healthcare infrastructure (Yescombe, 2011). Emek (2015) suggests that, if the crucial conditions are met, partnering with the private entity may demonstrate superiority over publicly financed service provision.

Public-private partnerships are not well known in some European regions (Jovanovic et al, 2013). Therefore, the aim of this paper is to a) develop a set of indicators for the measurement of PPPs' potential, b) thoroughly analyse and compare the potentials for the implementation of PPPs, and c) develop a set of policy recommendations for their implementation in health care systems of some countries.

2. Related works

2.1. Public-private partnerships in health care

There is no single explanation of PPP phenomenon. The definitions fill a space between the traditional government procurements and privatization (Grimsey and Lewis, 2005). Generally speaking, PPP is "a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance" (WB/ADB/IADB, 2014). A PPP bundles investment and service provision of infrastructure into a single long-term contract (Engel et al., 2014). The main feature of PPP is the allocation and sharing of risk among parties (Ke et al., 2010).

Proponents of PPPs in health care argue that they are an irreplaceable long-term solution due to the fact that the public sector alone cannot solve numerous issues in medical treatments (Smith, 2000). World Health Organization (2015) recognizes that partnerships of public and private entities should combine the different skills and resources in an innovative way in order to contribute to improving health, but these partnerships need to be "carefully considered and well-articulated". This scepticism is fuelled by PPP flaws such as the reduction of governments'

ability to adapt to changing needs (Ross and Yan, 2015) and high negotiation costs (Välilä, 2005).

Types of PPPs in health care can vary on the basis of the constituent membership or the nature of activity (Widdus, 2004). Nishtar (2004) provides a list of PPP projects initiated by governments or inter-governmental agencies with for-profit and not-for-profit organizations. On the other side, PPPs can be categorized by nature and purpose they serve. These partnerships can be between large companies and international agencies with broad goals and strategies (Smith, 2000). However, more operative and financially modest partnerships are more common (Mitchel, 2008).

2.2. Critical success factors in public-private partnerships

PPPs must guarantee a win-win situation for all entities involved in the implementation of such concept (Mota and Moreira, 2015). Various studies have already segmented homogenous factors which contribute to the success of PPPs.

Critical success factors (CSFs) are defined as "those few key areas of activity in which favourable results are absolutely necessary" for decision maker to reach their goals (Rockart, 1982). Ever since the emergence of PPPs, the concept of CSFs has been employed by many researchers aiming to find the best ways for the implementation of PPPs (Liu et al., 2014).

Osei-Kyei and Chan (2015) find that risk allocation and sharing, strong private consortium, political support, community/public support and transparent procurement are the key CSFs examined and explored in the extant publications on PPPs. On the other side, Li et al (2005) find that the most important factors for PPPs are effective search, project feasibility, government assurances, economic conditions and financial factors. To some extent, similar classification is given in Mota and Moreira (2015) who emphasize intrinsic (economic, legal and political environment), and extrinsic (economic viability, trust, risk management and procurement) success factors. Finally, Ng et al. (2012) state that the right mixture of adequate technical, financial/economic, social, political, legal and other factors can assure appropriate implementation of a PPP arrangement.

Aforementioned CSFs present a solid set of measures for determining the quality of future of PPPs based on the experiences from the best cases of previous projects. However, they are funded on previous practice and do not depict the potentials for the implementation but rather examine previous experiences in the field. Raisbeck and Tang (2013) are closer to the analysis of ex-ante critical success factors as their study is focused on the initial design stages of PPP projects. Closer to actual ex-ante CSFs is the study conducted by Gannon and Smith (2011), as they outlined a PPP business case to ensure a better forecasting of PPP projects' affordability and success.

Having in mind previously elaborated literature and specificities of the health care sector, we have isolated a few ex-ante CSFs that are important for the health care PPPs and grouped them into three categories: (1) health care system characteristics, (2) technical potentials of the system, and (3) political, legal and social potentials, and experiences with PPPs.

3. Methodology

3.1. Methods

For the purpose of the analysis, we reworded the six-itemed generic quality criteria for cross-country comparison elaborated (Cacace et al., 2013; Milosavljevic et al., 2016). Firstly, we developed a set of variables and indicators based on a PPP critical success factors studies

discussed in the theoretical background of the paper. Secondly, we thoroughly selected the comparator countries. The main rationale for selecting European health care systems and comparing them to Adria countries counterpart, is based on the geographical proximity (Milosavljevic et al., 2014). Thirdly, we used a quantitative approach, having in mind the number of observed countries. Fourthly, we explored the contextual background of the health care financing in Slovenia, Croatia and Serbia, emphasizing all relevant elements related to the potentials of implementing PPPs and embedding them into the health care system. Fifthly, we used accurate data from reliable secondary sources such as international economic and health care agencies, peer-reviewed journals and best practice case studies. Moreover, we provided the explanation for any potential weakness of the data used in the study, as they may potentially incorporate pitfalls (Atkinson and Brandolini, 2001). Finally, the cross-country comparison provided useful data for the implications and recommendations for policy holders and other researchers, thus contributing to the existing body of knowledge in the field of health care policy.

3.2. Measures and data

We distinguished three broad categories of the ex-ante CSFs and developed 16 indicators for measurement. These categories, CSFs, indicators, definitions and sources of data are outlined in Table 1.

Table 1. Critical success factors, indicators, explanations, and sources of data

Critical success factor	Indicator	Definition	Source
Health care system financing			
Health care expenditure	Total health care expenditure	Expenditure on health by all government agencies in the country and that includes donor (external) fundings passing through these agencies [Intl $, PPP].	WHO/NHA
	Government expenditure	General government expenditure on health, as a percentage of total government expenditure [Intl $, PPP]	WHO/NHA
	Out-of-pocket expenditure	Any direct outlay by households whose primary intent is to contribute to the restoration or enhancement of the health status of individuals or population groups [Intl $, PPP].	WHO/NHA
Capacity for health care payments	Foreign direct investments	The value of foreign investors' equity in and net loans to enterprises resident in the reporting economy.	OECD
	Purchasing power	Price level ratio of purchase power parity conversion factor (GDP) to market exchange rate.	The World Bank
Technical factors			
Physical resources	Current capital stock	No. of hospitals per 100.000 inhabitants	WHO
		No. of acute beds per 100.000 inhabitants	WHO
Human resources	Quantity of medical professionals in country's health care system	No. of physicians per 100.000 inhabitants	WHO/NHA
		No. of nurses per 100.000 inhabitants	WHO/NHA
		No. of dentists per 100.000 inhabitants	WHO/NHA
		No. of pharmacists per 100.000 inhabitants	WHO/NHA

Health care customer satisfaction	The Euro Health Consumer Index	Index comprised of 48 indicators in the following areas: Patient rights and information, Accessibility/waiting time for treatment, Outcomes, Range and reach of services, Prevention and Pharmaceuticals	Health Consumer Powerhouse Ltd. (HCP)
Political, legal, social and other factors			
Favourable business environment	Ease-of-Doing Business Index	A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operation of a local firm.	The World Bank
Stability of political environment	Political Stability and Absence of Violence/Terrorism index	Perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism	The World Bank
Corruption	The corruption perceptions index	Perceived level of public sector corruption	Transparency International database
Experiences in PPPs implementation in health care	Liabilities related to PPPs	Off-balance sheet record of governmental liabilities related to public private partnerships	Eurostat

Source: authors' comprehension of various indicators

3.3. Composite I-Distance Indicator

A body of knowledge on ranking methodologies has been rapidly growing in last few decades. Nevertheless, most of them suffer from subjectivity and computational bias. Accordingly, we based our study on Composite I-distance Indicator (CIDI) methodology which proved to be successful in objective-based ranking (Dobrota and Dobrota, 2015; Dobrota et al., 2015; Dobrota et al., 2016).

The CIDI is based on an I-distance methodology (Ivanovic, 1973; Jeremic et al., 2011; Dobrota, Savic and Bulajic, 2015; Išljamović et al., 2015) and as a result it has an unbiased and impartial nature. Indicators are formed using the additive aggregation method, but without any biased weights. Instead, weights are created in an objective manner - by using the I-distance methodology which has the specific property of sorting the indicators in their order of importance for a total ranking. The I-distance relies on calculating the mutual distances between the processed entities and with regard to the one entity that is set to be the reference one (Dobrota et al., 2012). The calculus is given as follows (Ivanovic, 1973):

$$D^2\left(r,\ s\right) = \sum_{i=1}^{k} \frac{d_i^2\left(r,s\right)}{\sigma_i^2} \prod_{j=1}^{i-1}\left(1 - r_{ij.12\ldots j-1}^2\right)$$

where $d_i\left(r,s\right) = x_{ir} - x_{is}$ is the distance between the values of the variable X_i $\left(i = 1, 2, \ldots k\right)$ for entities $e_r = \left(x_{1r}, x_{2r}, \ldots x_{kr}\right)$ and $e_s = \left(x_{1s}, x_{2s}, \ldots x_{ks}\right)$, σ_i is the standard deviation of X_i, and $r_{ji.12\ldots j-1}$ is a partial coefficient of the correlation between X_i and X_j, $\left(j < i\right)$.

After finding the I-distance, it is possible to establish the correlations between the I-distance scores and each of the individual compounding indicators. Correlations are used because of the particular feature of the I-distance method: it can determine the relevance of input indicators. Weights are formed by weighting the empirical correlations: values of correlations are divided

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by the sum of correlations. The final sum equals 1, thus creating a novel appropriate weighting system:

$$w_i = \frac{r_i}{\sum_{j=1}^{k} r_j}$$

where $r_i \left(i = 1, 2, ... k\right)$ is a Pearson correlation between X_i and I-distance value. Thus, instead of subjectively defining the values of weights by experts, CIDI is based on a methodological and statistical concept defined by the I-distance method. One of the most important features of thus defined CIDI is that it is widely applicable, especially if the goal is to overcome the negative influence of bias.

4. Results and discussion

4.1. Country rankings

Before engaging into the ranking of countries, the process of weighting the individual indicators has been performed. In this process, all of the indicators have previously been transformed to have the same direction so that the process of the multi-criteria ranking of countries could be performed. Indicators have then been normalized in order to be scaled to the approximate values, in order to prevent some of the indicators to influence the ranking process too severely, because of the rates too high when compared to the others. The normalization was performed using the standardization method.

The list of individual compounding indicators and their weights created by the CIDI methodology, as defined in the previous chapter, are given in Table 2.

Table 2. Individual compounding indicators and their weights

Indicators	CIDI weights
Total health care expenditure	1.04 %
Government expenditure	2.05 %
Out-of-pocket expenditure	4.41 %
Foreign direct investments	9.22 %
Purchasing power	1.12 %
No. of hospitals per 100 000 inhabitants	7.76 %
No. of acute beds per 100 000 inhabitants	6.80 %
No. of physicians per 100 000 inhabitants	10.91 %
No. of nurses per 100 000 inhabitants	2.89 %
No. of dentists per 100 000 inhabitants	11.87 %
No. of pharmacists per 100 000 inhabitants	9.09 %
The Euro Health Consumer Index	9.89 %
Ease-of-Doing Business Index	10.30 %
Political Stability and Absence of Violence/Terrorism index	3.80 %
The corruption perceptions index	0.34 %
Liabilities related to PPPs	8.52 %

Source: authors' calculation

The property that is specific to the unbiased and objective weights created by CIDI is that they are not necessarily rounded nor equal for individual indicators, as well as that they are given with the desired number of decimal places. According to the weights given in Table 1, the most important indicator for ranking countries by CIDI methodology is the number of dentists per 100 000 inhabitants, with the weight of 11.87%. It is followed by the number of physicians per 100 000 inhabitants (10.91%), which comes from the same critical successes factor, a technical factor - human resources. Third in a row is Ease-of-Doing Business Index (10.30%), from a group of political, legal, social, and other factors. It is later followed by The Euro Health Consumer Index (9.89%) that again comes from the group of technical factors - health care customer satisfaction. This brings us to the conclusion that the technical factors are dominating the ranking of countries in terms of potentials for the implementation of public private partnerships in the observed health care systems. This proves that the countries with low human and technical capacities in health care and bad performance in hospitality towards patients have the highest potential for the implementation of PPPs (see Basu et al., 2012).

On the other hand, some of the indicators are found to have a very poor influence on the ranking process. An indicator that represents the corruption perceptions index only has a 0.34% influence on the CIDI score, and comes from the group political, legal, social and other factors. This is contrary to the previous work related to critical success factors in public private partnerships which contend that corruption is highly significant factor for the success (e.g. Hwang et al., 2013). Total health care expenditure and purchasing power, indicators that both come from the group health care system financing factors, have around 1% influence each. Thus, system features of the examined countries are not strong predictors for the potentials for the implementation of public private partnerships.

The results of the CIDI methodology, represented in terms of CIDI scores and CIDI ranks are given in Table 3. It should be noted that the CIDI scores have been normalized to take values from 0 to 100, mainly for the reasons of the clear and intelligible interpretation of the results.

Table 3. CIDI scores and CIDI ranks

Country	CIDI score	CIDI rank	Country	CIDI score	CIDI rank
Montenegro	67.39	1	Romania	48.84	18
Albania	60.59	2	Belgium	48.27	19
Hungary	57.95	3	Italy	48.26	20
Ireland	56.31	4	Iceland	48.10	21
Malta	56.00	5	Latvia	47.89	22
Cyprus	54.83	6	Slovak Republic	47.38	23
Luxembourg	53.32	7	Sweden	47.36	24
Bulgaria	53.17	8	Portugal	47.30	25
Netherlands	52.54	9	Denmark	46.19	26
Serbia	**52.43**	**10**	Czech Republic	46.17	27
Switzerland	51.40	11	Finland	45.81	28
Slovenia	**51.23**	**12**	Estonia	45.77	29
Poland	50.72	13	Norway	45.09	30
Croatia	**50.66**	**14**	Lithuania	44.39	31
Spain	50.56	15	Macedonia, FYR	44.34	32
Greece	49.44	16	France	44.19	33
United Kingdom	48.84	17	Austria	43.94	34
			Germany	43.32	35

Source: authors' calculation

In terms of improving the economy's healthcare system, Montenegro is first ranked, with the CIDI sore of 67.39. It is followed by Albania (60.59), Hungary (57.95), Ireland (56.31), and then Malta (56.00). Montenegro, Serbia, and Albania have the highest scores for the indicators number of dentists per 100.000 inhabitants, while Albania and Montenegro have the highest scores for the indicators number of physicians per 100 000 inhabitants.

Lowest ranked countries are more developed counties - France, Austria, and Germany. A surprising result is that Macedonia is very low ranked and that it comes after some of more developed countries that we expected to be better positioned, like Sweden, Switzerland, or UK.

4.2. Discussion and recommendations for selected countries of Adria region

The study aimed to develop a set of indicators for measuring the potential of implementing the public-private partnerships in health care systems and ranking countries accordingly. Afterwards, we analyzed and compared these rankings of Slovenian, Croatian and Serbian health care systems in order to draw a policy recommendation. These countries share the same historical heritage, but have been shaping their systems differently in last three decades. Although the data was collected for a single year, this study can be viewed as an evolutionary, as it tracks three countries on a different level of development, EU accession phase and welfare status.

The study found that Serbia faces the highest fiscal pressure for the inclusion of private financing of health care service, as the public health care expenditure relative to GDP is the highest in the region. Moreover, a large portion of out-of-pocket payments creates the potentials for the private provision of health care services. This is in line with the extant studies stating that PPPs are emerging as an attractive strategy in low and middle-income countries (Martin and Halachmi, 2012). The majority of health care provision in examined countries comes from public sources. A broad body of evidence indicates that complex health care challenges cannot easily be tackled by a single sector (Reich, 2002), particularly regarding the cost efficiency of interventions and total health care expenditures. Nevertheless, the efficiency is not the only issue for successful PPPs. The government has its leadership role, even if the contractual agreement does not explicitly state so. The examined countries are continually reforming health care systems, which is not a good soil for adequately-governed (Ghere, 2001), long-standing (Benković et al., 2011) and publicly accountable partnerships (Bovaird, 2004). In a nutshell, all the examined countries share the need for the implementation of PPPs in the health care. This implies that it should be used as an additional, rather than dominant model for the provision of health care services.

The analysis of the technical elements of health care systems indicated noteworthy lagging behind capacities of EU countries, especially in Serbia. Increased investments in healthcare infrastructure and introduction of new medical technologies are required to improve the efficiency of health systems. The necessity of additional financial resources for the provision of abovementioned features fosters development and application of PPPs in order to bridge the gap between provision of health care infrastructure and resources for their funding. Once again, the current efficiency is far beyond the expectations, which is in line with the extant findings (Miljanović and Janković, 2006). This is a solid driver for the improvements of health care provision and inclusion of private entities advocated as efficiency facilitator in PPPs in the region (Žarkić Joksimović et al., 2014). As regards human resources, each of the examined health care systems is faced with a significant lack of medical professionals. This is an essential prerequisite for ensuring the health care quality, but requires increased investments in continuous education and training of human resources in the region (Supic et al., 2010). Summing this up, all the examined countries have discrepancies in the current technical and

human capacities with unmet needs for high quality health services. This drives the need and potential for new financing sources, and paths the way for the implementation of PPPs.

All three countries introduced the laws on PPPs. However, political, legal and social backgrounds are to some extent mixed. The most preferable system is Slovenian, as it demonstrates the highest political, social, and non-corruptive trends. It is followed by Croatian, whereas the Serbian economic and health care systems exhibit poor performances regarding aforementioned criteria. As seen from the current experiences in the region, this seems to be the most prominent driver of PPPs at the moment. Although, there are some evidences of PPPs in health care, they are still at an infantile phase. As the results indicate, there is a mixed potential for the implementation of PPPs in health care. Although the need for additional financing and investments in health care are required, the system thinking (Loosemore and Cheung, 2015), risk assessment techniques (Milosavljevic and Benkovic, 2009) and detailed value for money analysis (Nisar, 2007) have to be incorporated in recommending PPPs as a valid method for health care improvements.

5. Conclusions

This study provides information about the CSFs and potentials for the inclusion of private capital in financing health care services and infrastructure. The results would be more comprehensive and illustrative if the views of the policy holders and decision makers were included in the analysis. The changes in health care financing policy of Slovenia, Croatia and Serbia led to the development of different systems and different backgrounds for the inclusion of private capital in funding health services. Although some evidence on PPPs exists in a region, the concept is still at its infancy. As the results indicate, the potentials for the implementation exist, particularly from the fiscal pressures and needs for new investments points of view. However, any actual implementation should take into consideration all the risks involved. All stakeholders could benefit from this, but the desirability and viability of the PPP will depend on micro and project-based, rather than system based features.

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