

## EFFICIENCY AND PRACTICAL ASPECTS OF THE BALANCED SCORECARD IN POLISH SPECIALISTIC HOSPITAL

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The article presents the Balanced Scorecard concept combined with sustainable and Data Envelopment Analysis method. Results of research are conducted with implementation of the Balanced Scorecard with the management of a Polish hospital in Wrocław. The article introduces the issue and present positive effects that can be gained by the management of a Polish hospital when using the BSC. This seems to be right, because Polish managers of health service units still find it very difficult to draw up a development strategy or formula and then follow their mission. For example, adding the DEA method of assessing effectiveness to BSC should lead to improved effectiveness of using resources that are at their disposal understood as achieving the planned health results.

**Keywords:** Balanced Scorecard, Hospital, Efficiency, Management

### Introduction

About two decades have passed since the concept of the Balanced Scorecard was first presented by its authors: Kaplan R. S. and Norton D. P., professors at Harvard Business School. Still, the tool continues to be considered state-of-the-art and revolutionary in Polish economy. Following western and, obviously, American trends, Polish market leaders became fascinated with solutions such as, for example, BSC. However, according to many Polish researchers, including Jablonski M. and Jablonski A., currently dedicated to the implementations of the BSC in Polish companies, the number of companies in Poland that have implemented the BSC concepts correctly is small. The same goes true for health service units. For over five years now, publications on the BSC in the Polish health service have been appearing. Nevertheless, a large number of mature Polish hospitals are far from using the card. Due to this, the benefits of using this method effectively for Polish organisations have not been fully discovered yet.

In Poland, many hospital managers are convinced that the BSC was created for companies only. Global practices show that for over a decade the Balanced Scorecard has been successfully used in many developed countries not only by business people. Around the World, the concept is applied by government organisations, local governments or institutions of various kinds, such as universities and health service organisations, hospitals included, in order to satisfy the needs of their clients in a more effective and efficient way.<sup>1</sup>At present, Polish health service units are

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<sup>1</sup>Nieplowicz M., Zrównoważona karta wyników dla szpitala [Balanced Scorecard for a Hospital], [in:] Rachunkowość a Controlling - Prace naukowe AE Wrocław no 1174, Nowak E. (ed.), Wydawnictwo Naukowe AE, Wrocław 2007, p. 395.

aiming at active competition based on the rules of a free market economy. This, in turn, activates strategic thinking in the managers that such units employ. The rules should be based on balancing the aims of the organisation for all the stakeholders.

### **The definition of The Balanced Scorecard**

Balanced Scorecard (BSC) in short, it's a management system that enables your organization to set, track and achieve its key business strategies and objectives. Once the business strategies are developed, they are deployed and tracked through what we call the Four Perspectives of the Balanced Scorecard.<sup>2</sup> The concept of the Balanced Scorecard was developed in the early 1990s as a new approach to performance measurement due to problems of short-termism and past orientation in management accounting (Kaplan and Norton, 1992). The concept of the BSC is based on the assumption that the efficient use of investment capital is no longer the sole determinant for competitive advantages, but increasingly soft factors such as intellectual capital, knowledge creation or excellent customer orientation become more important. As a reaction Kaplan and Norton suggested a new performance measurement approach that focuses on corporate strategy in **four perspectives** (Kaplan and Norton, 1992, 1997, 2001). This BSC aims to make the contribution and the transformation of soft factors and intangible assets into long-term financial success explicit and thus controllable. The BSC's four perspectives can be characterized briefly. **The financial perspective** indicates whether the transformation of a strategy leads to improved economic success. Thus, the financial measures assume a double role. On one hand, they define the financial performance a strategy is expected to achieve. On the other hand, they are the endpoint of cause and effect relationships referring to the other BSC perspectives. **The customer perspective** defines the customer/market segments in which the business competes. By means of appropriate strategic objectives, measure, targets and initiatives the customer value proposition is represented in the customer perspective through which the firm/business unit wants to achieve a competitive advantage in the envisaged market segments. **The internal process perspective** identifies those internal business processes that enable the firm to meet the expectations of customers in the target markets and those of the shareholders. Finally, **the learning and growth perspective** describes the infrastructure necessary for the achievement of the objectives of the other three perspectives. In this case, the most important areas are qualification, motivation and goal orientation of.<sup>3</sup>

### **Scorecards designed for hospital**

Management guru Peter Drucker once observed that the most common source of mistakes in management decisions is the emphasis on finding the right answer rather than the right question. The single most important question to ask yourself before embarking on a Balance Scorecard

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<sup>2</sup>Hannabarger Ch., Buchman R., Economy P., *Balanced Scorecard Strategy For Dummies*, J. Wiley Publishing, Hoboken, NJ, 2007, p. 29.

<sup>3</sup>Figge F., Hahn T, Schaltegger S., Wagner M., *The sustainability balanced scorecard – linking sustainability management to business strategy*, *Business Strategy and the Environment* Bus. Strat. Env.11, Published online in WileyInterScienceDOI: 10.1002/bse.339, p. 270-273.

implementation is simply: Why? Why are we developing a Balanced Scorecard for this organization and why now?<sup>4</sup>

The Balanced Scorecard has risen to the performance measurement challenge of the private sector and is equally well-equipped to facilitate a rapid and dramatic transition of twenty-first-century non-profit and public organizations.<sup>5</sup> The need to apply balanced measurement of achievements in the public sector depends on how much the subjects of this sector have to compete for clients and funds. Currently, the number of subjects in the public sector that are interested in gaining limited funds from sponsors, benefactors, societies, foundations and government organizations is rising. Health service units have to introduce strategic management mechanisms that will allow them to survive and develop.

Many hospitals are not ready for a method like BSC. They contend with debts and have no financial liquidity. They are managed in a completely inadequate way, and the turbulent environment does not support any improvement of this state. However, there are hospitals that manage to operate well, for example all hospitals in Lower Silesia have excellent financial liquidity. It is beyond doubt that all of them need changes to develop in each field. By imitating western neighbours and in accordance with the sustainable development strategy it seems to be right to at least follow the way towards the implementation of tools such as BSC.

The BSC method should undergo a change. The authors of the BSC method have left the option of developing their tool with more perspectives. In the future, for example, it can help monitor elements of environment protection in an organisation. It is especially important in hospitals.

The perspective that binds all the other areas of hospital activity is a financial perspective. The assessment of activities in this perspective will focus on answering the following question: how to balance costs with income or how to maintain relative financial liquidity? In the current legal situation in Poland, a public hospital does not have an owner who would require it to generate profit. On the other hand, private hospitals that are managed as companies can consider objectives related to ensuring their owners profit.

Taking into account the specific conditions for the operations of a service organization such as a hospital, it should be the customer's, and not the financial, perspective that is put forward to the foreground. The financial aspect plays a limiting role, yet it is not the superior objective of a hospital's functioning. Success cannot be measured on the scale of savings, because it is not clear whether these have been achieved at the expense of the hospital's mission. Also, the level of using up the limits imposed by the payer of health benefits cannot serve as a measure of success, because it does not inform about the effectiveness and efficiency of the clinic.

Being non-profit organisations, public hospitals are focused on completing their public utility mission. They have been established and operate in order to ensure their patients adequate health care. An important role in hospitals is played by their patients and their conduct on the medical services market. Patients are the most important group of customers in the health care sector; without them, it would not be possible for medical operations processes to take place. Thus, the **patients' and market perspective** has to be taken into consideration when assessing the achievements of a hospital.

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<sup>4</sup>Niven Paul R., *Balanced Scorecard Diagnostics: Maintaining Maximum Performance*, John Wiley & Sons, Hoboken, NJ, 2008, p. 24.

<sup>5</sup>Niven Paul R., *Balanced Scorecard: Step-By-Step for Government and Nonprofit Agencies*, John Wiley & Sons, Hoboken, NJ, 2008, p. 31.

The right approach to the operations of a hospital is to treat it as a system of processes whose effectiveness and efficiency influences customers' level of satisfaction. By selecting the aims and measures in the **perspective of internal processes**, managers can answer the question about the processes (current and new) a hospital has to excel at in order to gain customers' satisfaction and, as a result, achieve financial objectives.<sup>6</sup> By selecting the aims and measures in the **perspective of knowledge and development**, above all it is necessary to take into account the hospital's resources and think about the following question: what infrastructure is necessary to carry out key processes and how to develop it in order to ensure perfection? In this perspective, employees and their potential are a crucial area of interest. In a hospital, qualified staff is an elementary non-material resource. The aim of this level is to achieve such engagement of the staff by ensuring them development that will make it possible to gain the objectives stated in the other levels. It is worth noticing that a suitable organisation of the process of providing medical services and staff's work time influences the quality and efficiency in handling patients, and also on their satisfaction level (patient's dimension). It also influences the cost of providing the services, and in this case the fundamental financial factor – the hospital's financial perspective – becomes important again.

Understanding the objectives of various groups of stakeholders by the organisation is a prerequisite for the correct functioning of strategic aims that should be included in the organisation's card from the stakeholders' point of view. For health care units that are not profit-oriented it is important to have two different groups of stakeholders: beneficiaries and founders. The category of beneficiaries comprises patients and benefit recipients – their interests have already been presented from the patient's point of view. On the other hand, the owners and founders, health benefit payers (the National Health Service in Poland, Ministry of Health, private insurers), public administration bodies that shape health politics, doctors cooperating with the hospital, staff and labour union organisations, providers of drugs, medicines and medical equipment, contractors, financial institutions, and even local communities, have a considerable influence on the operations of the hospital, thus the **stakeholders' perspective** should take into account the interests of the most important and most interested groups of information recipients.

When discussing balanced management in health service, it is reasonable to expand the basic number of Balanced Scorecard perspectives with an additional one that is particularly important in hospital service, i.e. **environment protection, and health and safety**. It includes indicators for the measurement and monitoring of activities related to ecology, and health and safety at a medical unit. Ecological fees, ecological fines and the costs of investment into pro-ecological actions should also be the subject of analysis. Budgeting the scope of finances related to environment protection and health and safety should also allow to distinguish and assess the company's assets used in this activity and the sources of their financing.<sup>7</sup>

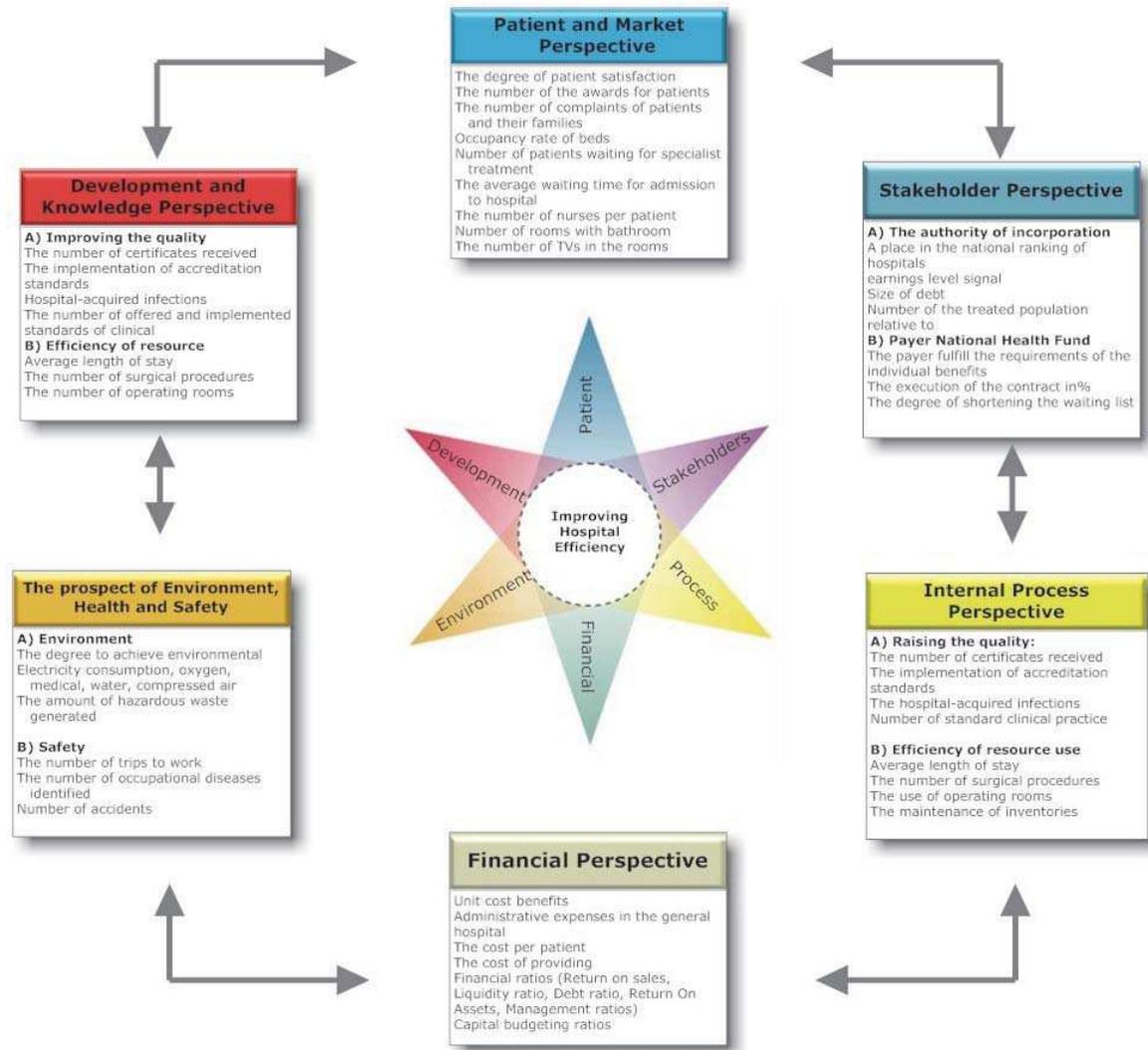
The information above discussed with the board of a specialist hospital in Lower Silesia allowed the author to draw up a modern and up-to-date model of the Balanced Scorecard for a health care unit. Its balanced dimension is based on six perspectives; additionally, the following

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<sup>6</sup> Maria Hass-Symontiuk (ed.), System pomiaru i oceny dokonań szpitala [System of Measurement and Assessment of Hospital Achievements], ABC a Wolters Kluwer Business, Warsaw, 2011, p. 187.

<sup>7</sup> Jabłonski A., Jabłonski M., Wdrażanie Strategicznej Karty Wyników w jednostkach służby zdrowia [Implementing the Balanced Scorecard in Health Care Units], *Controlling i Rachunkowość Zarządcza* no 6 (81) on 2006.06.05, p. 29.

picture shows examples of measures that the Lower Silesia hospital is able to generate and that can be applied in each perspective of the Card.



**Figure 1.** Balanced Scorecard in Polish Health Care Unit proposal.

Source: Own elaboration based on Maria Hass-Symontiuk (ed.), *System of Measurement and Assessment of Hospital Achievements*, ABC a Wolters Kluwer Business, Warsaw Jabłonski A., Jabłonski M., *Implementing the Balanced Scorecard in Health Care Units*, *Controlling i Rachunkowość Zarządcza* no 6 (81).

The German model described by Antje Krey is different due to the lack of engagement in environment protection, yet it is focused on competitors, making them the perspective of the card. In Poland, such a solution can be only useful when the market makes the competition among hospitals more homogenous after much restructuring. Another important aspect of a hospital that is worth considering in the future for the BSC is the quality of shared benefits and the notion of ethics in medical activities. Along with the implementation of measurements systems for the assessment of a hospital’s achievements, this area should be a separate analysis perspective, but for the time being these considerations are more of a forecast. The same goes

true for the IT area and the ongoing computerization; this element can also see a separate surface. The most important is that the separated perspectives and the objectives and measures that they include guarantee sustainable development and effectiveness of an organization that is examined.

### The scorecard, and the effectiveness of hospital

Having a basic understanding of the perspectives for balanced scorecards is the first step in establishing balanced scorecard strategy for organization. After covering the basics and considering the best approaches to understanding needs and making plans for implementing own balanced scorecards.<sup>8</sup>

The model presented in the previous point is general. This universal character of the model will make it possible to apply it in every public hospital in Poland. With such a solution, the measures ordered according to the BSC perspectives will make it possible to use statistical/econometric methods, analyse the balance inside the card and assess the effectiveness of a hospital.

With the card, the data collected in the measures ordered according to the perspectives will undergo statistical measurement and will be analysed with the assessment method of:

- the level of sustainability
- the effectiveness of a hospital with the DEA method.

In his publications, Ryńca R. proposes the following calculation of the measure of the BSC sustainability level:

$$D = \frac{\sum_{i=1}^M |S_i(x) - S(x)|}{M}$$

$$S_i(x) = \frac{1}{l_i} \sum_{k=1}^{l_i} \frac{W(x, i, k)}{C(x, i, k)}, (i = 1, \dots, M; k = 1, \dots, l_i)$$

$$S(x) = \frac{1}{M} \sum_{i=1}^M S_i(x)$$

where:

D – measure of balance among the BSC perspectives

M – number of perspectives in the scorecard

$S_i(x)$  – average level of completion of all the objectives in each perspective separately

$S(x)$  – weights defining the importance of each outlay

$C(x, i, k)$  – target value of k-th measure in the i-th perspective BSC

<sup>8</sup>Hannabarger Ch., Buchman R., Economy P., *Balanced Scorecard Strategy For Dummies*, J. Wiley Publishing, Hoboken, NJ, 2007, p.27.

$W(x, t, k)$  – current value of the appropriate measure in the BSC perspective

The calculations can be transferred to a radar chart. Not only does the indicator show the level of perspective sustainability, but with the chart it also illustrates the level of completion of objectives from each perspective. It is easy to notice which perspectives of the hospital are better or worse developed with respect to sustainability.

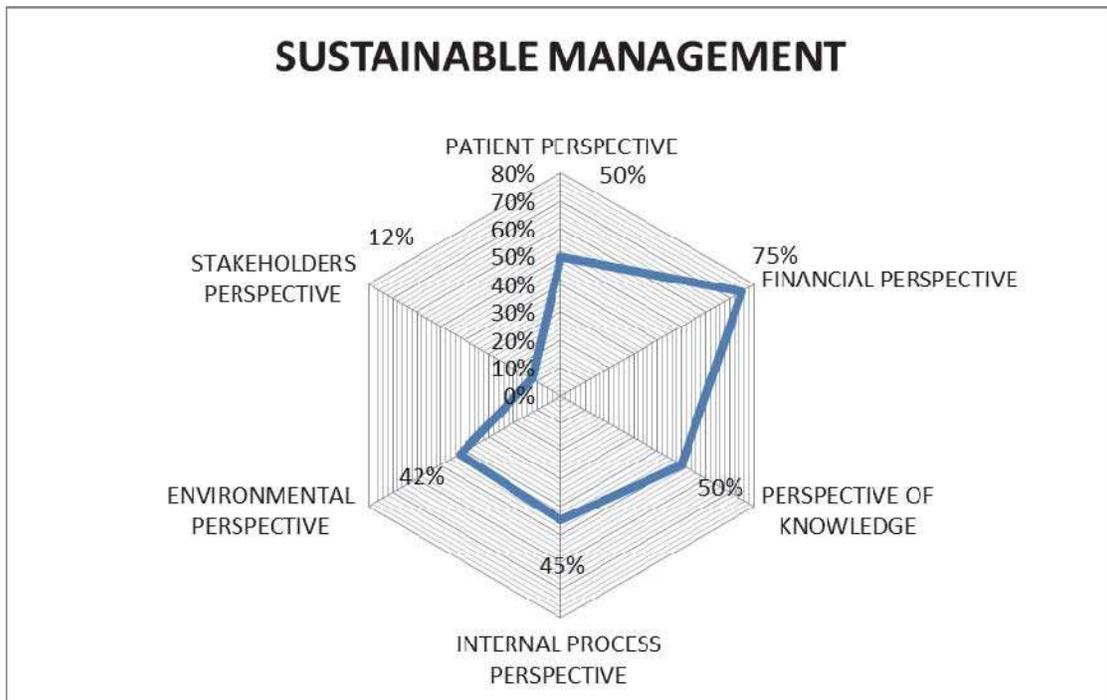


Figure 2. Balanced Scorecard sustainable management presented on radar chart. Source: Own elaboration.

The radar chart above allows to follow whether tasks carried out by a unit and monitored by the BSC have a balanced course. In the example above it is easy to notice that from the financial perspective the objectives are carried out in 75 %. The remaining objectives, especially the stakeholders’ one, show that in these areas there is a problem with completing tasks. It can even point to a worse situation where the full involvement of the hospital administration into a unit’s financial activities does not translate into stakeholders’ satisfaction. Furthermore, it can lead to limited financial resources that Polish hospitals receive from contracts with the National Health Fund. This in turn can lead to a hospital’s debts and worsening of the patient’s perspective in the future that anyway is only partially carried out in the case presented. This shows that the hospital is not well organised and there is a need to introduce important changes.

The widely used methods to estimate technical or cost efficiency of individual firms can be classified into non-parametric and parametric methods. Nonparametric methods, like Data Envelopment Analysis (DEA) introduced by Charnes et al. (1978), solve an algorithm that constructs the convex hull of the observed data points to define the deterministic cost or production frontier of the hospitals. Parametric methods like Stochastic Frontier Analysis (SFA), simultaneously introduced by Aigner, Lovell and Schmidt (1977) and Meusen and van den

Broeck (1977), are based on the idea of estimating a stochastic cost or production frontier, which splits the estimated inefficiency into two components. The first component controls for random noise whereas the second component captures the deterministic inefficiency of the hospital. Maximum Likelihood estimation is used to find a solution to the highly non-linear estimation problem.<sup>9</sup> An article is concentrated on DEA method. This method is a well-known concept by Debreu G. and Farrell M.J. related to productivity, which was confronted with the new approach by Cooper W. and Rhods E. L. In the 1970s, the latter two created a method that is currently known as DEA, which is short for Data Envelopment Analysis. The method uses linear programming that makes it possible to examine the relations between the level of outlay and results, and on the basis of this research allows to establish the effectiveness curve.<sup>10</sup>

$$Effectiveness = \frac{\sum_{r=1}^S \mu_r Effect_r}{\sum_{i=1}^m v_i Outlay_i}$$

where:

S – number of effects,

m – amount of outlay,

$\mu_r$  – weights defining the importance of each effect

$v_i$  – weights defining the importance of each outlay

Using the above formula and linear programming, an unlinear form of the objective function is created that consists of the sum of outlays and results for a given unit, e.g. for hospitals. The function represents the formula:

$$max = \frac{\sum_{r=1}^S \mu_r y_{r0}}{\sum_{i=1}^m v_i x_{i0}}$$

with the following constraints:

$$\frac{\sum_{r=1}^S \mu_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \leq 1, \text{ for } j = 0, 1, \dots, n_j$$

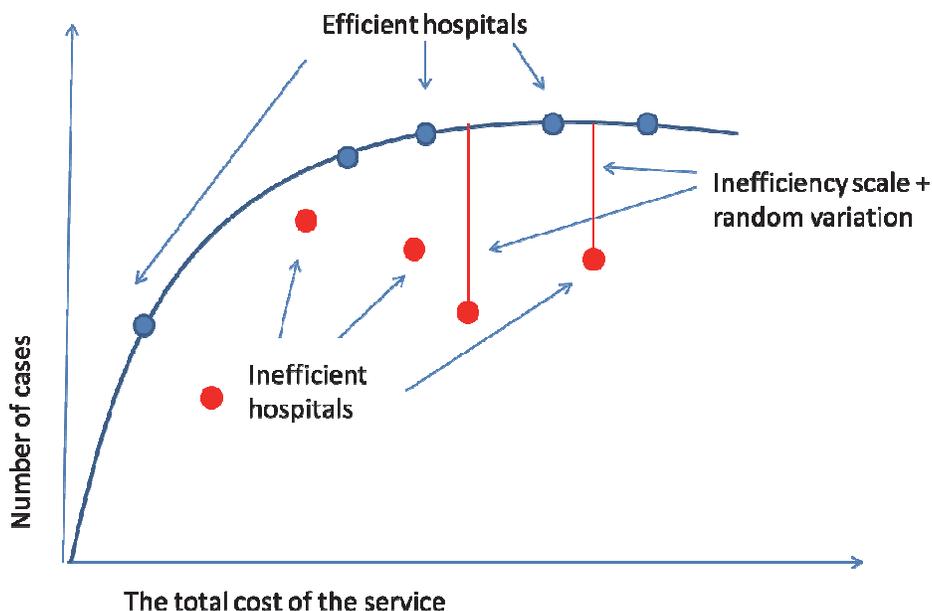
where:

$\mu_r, v_i$  – are coefficients of the weights for  $x_{i0}$  outlays and  $y_{r0}$  effects respectively.

<sup>9</sup>Frohloff A., Cost and Technical Efficiency of German Hospitals – A Stochastic Frontier Analysis, Ruhr Economic Papers #2, Essen, Germany, 2007, p. 5.

<sup>10</sup>Rogowski G., Analizy i oceny działalności banku na potrzeby zarządzania strategicznego [Analyses and Operations Assessment of a Bank For Strategic Management], WSB, Poznan 1998.

The most efficient hospitals will be those that are present on the effectiveness curve. The remaining ones will be those that will be out of the curve and will be deemed ineffective. An example of the efficiency curve is presented below.



**Figure 3.** An example of the efficiency curve.

Source: Elaboration based on presentation of Warsaw SGH Professor Nojszewska E. about *Measuring the efficiency of hospitals using stochastic cost limit function*, presented at the II Conference "Economics in Health Care" Kudowa Zdroj, Poland, 15/16.11.2012 r.

On the illustrated case hospitals are lying on the curve that is cost-effective to optimize the level of costs for a given level of "product." In this embodiment "product" is the number of cases of hospital-weighted for example, their difficulty. Hospitals lying under the curve are inefficient, what means that with the same costs they generate less product or the same product formed at a higher cost. The distance from the curve to the cost-effectiveness of a hospital located under the curve is the sum of inefficiency and variations of the misfortune type.<sup>11</sup>

A health care unit can be technically effective if it maximizes the effects achieved with a given level of outlays or if it minimizes them in order to achieve the level of results planned. The measurement of effectiveness gives a reliable picture of the unit as compared with other similar subjects examined.

## Conclusions

In Marburg, Germany, the BSC model has been used since 2000 and the special emphasis is put on the clinical orthopaedic and gynaecological wards. Apart from the strategic orientation towards the satisfaction of typical stakeholders, the model was also oriented to balance strategic

<sup>11</sup> Nojszewska E., *Efektywność ekonomiczna jako narzędzie analityczne dla ochrony zdrowia*, [Economic efficiency analysis as a tool for health care], University of Warsaw, Issues Management, vol. 9, no 3 (33): 11 – 26, Warsaw 2011, p. 11-13.

aims with respect to the development of students and academic staff. Conflicts related to the processes of treatment and scientific research were taken into account. The project also allowed to considerably decrease the hospital's expenses, which, as a consequence, made it possible to increase the expenditure on investment.<sup>12</sup>

The power of the growth dashboard can help with adjustments across all perspectives of Balanced Scorecard, when product or service deployment performance indicates potential market strengths or possible weaknesses. The medical services industry, where competition is heating up with respect to what facilities provide in health enhancing and maintenance services. This industry is growing by leaps and bounds, with the leaders only just barely ahead, enabled through real-time performance and development measures. In fact, because of the level of growth in this market, hospitals and medical service organizations are redefining the way they provide services and in overall patient treatment, with emphasis moving from traditional systems to structures that focus on the total health of their customers and patients. In US one large, Midwestern medical hospital services provider has actually designed their Balanced Scorecard around the growth and development trends, instead of the more traditional financial measurement and performance perspective. They fully integrate their growth dashboard measures and indicators into decisions related to internal business process performance as it relates to customer satisfaction, which eventually results in financial performance. This particular hospital designed their dashboard to show all BSC perspectives on one screen, interlinking the dashboard elements as related to their scorecard parts, so that their managers can see when any measurement moves in a particular direction, and can immediately see the effect on the other dashboards' measures as well, and make adjustments in services, take specific action, shift resources, or re-prioritize key initiatives in order to keep up with changes in demand or need.<sup>13</sup>

In the Polish managerial practice, the author has come across the following statement by one of a hospital's managers: '*...this Balanced Scorecard is here somewhere*'. The BSC reduces the amount of information, and a hospital really produces a lot of it. Thus, it is important to select the key information set from the ocean of data. This is exactly what a properly implemented Balanced Scorecard guarantees. With respect to budgeting a hospital's expenses, the Balanced Scorecard provides a new sense to this technique. The budget is treated as a key constraint to complete superior objectives. What is more, it makes the process of budgeting easier, interferes with restructuring and investment activities, and other important projects with a longer perspective of completion.

In Poland, it can be noticed that some hospitals boast the strategy they have and follow, or even their Balanced Scorecard. Unfortunately, however, small shortcomings in their projects (e.g. period of update of key objectives measures only once a year) lead to a conclusion that these are at most "dead" projects. The author means templates existing on paper that have never seen their proper implementation. Indeed, schemes "on paper" are a basis for the implementation of a concept. Yet, the BSC gains the proper meaning only as a coherent information system of an organisation. It should not be forgotten that it is an integrated tool for management. A range of measures and a template project are just the first level. Only a balanced scorecard that is

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<sup>12</sup>Jabłonski A., Jabłonski M., *Wdrażanie Strategicznej Karty Wyników w jednostkach służby zdrowia* [Implementing Balanced Scorecard in Health Care Units], *Controlling i Rachunkowość Zarządcza* no 6 (81) of 2006.06.05., p. 29.

<sup>13</sup>Hannabarger Ch., Buchman R., Economy P., *Balanced Scorecard Strategy For Dummies*, J. Wiley Publishing, Hoboken, NJ, 2007, p. 29. 332.

integrated as an IT program, effectively managing the efficiency of an organisation, is a “live” concept on the highest level that brings results. By creating such an IT Balanced Scorecard, hospital managers will then be able to be more precise about their strategic aims and the basic factors that influence their performance.<sup>14</sup>

Using the system of measurement and assessment of hospitals’ achievements with the BSC supplemented with the DEA method of effectiveness assessment, for example, should lead to improved effectiveness of using the resources that are at their disposal. The effectiveness is understood as achieving the health effects assumed at optimum cost or maximizing the health effects with precisely defined financial resources.<sup>15</sup>

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<sup>14</sup>Nieplowicz M., *Zrównoważona karta wyników dla szpitala* [Balanced Scorecard for a Hospital], [in:] *Rachunkowość a Controlling - Prace naukowe AE Wrocław* no 1174, Nowak E. (ed.), Wydawnictwo Naukowe AE, Wrocław 2007, p. 397.

<sup>15</sup>Maria Hass-Symontiuk (ed.), *System pomiaru i oceny dokonań szpitala* [System of Measurement and Assessment of Hospital Achievements], *ABC a Wolters Kluwer Business*, Warszawa, 2011, p. 9.

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