

A SIMPLE METHODOLOGY FOR MEASURING STRATEGIC BUSINESS PERFORMANCE IN BANKS

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Abstract

Performance management plays a core role in assessing strategic performance of commercial banks. The aim of the paper is to propose a simple methodology for measuring strategic bank performance based on the four perspectives of the balanced scorecard (BSC) approach. Using the example of one of the Slovak banks, we select key performance indicators (KPIs) of banking performance and propose an algorithm for constructing a composite index of strategic performance. The resulting composite index of strategic performance is constructed from four sub-indices evaluating performance in the four perspectives of the BSC: the financial perspective, the customer perspective, internal processes, and learning and growth. The proposed methodology enables banks to assess the state and the outlook of their strategic business performance and helps managers in decision-making for the future.

Key words: *performance management, balanced scorecard, banks, composite index.*

1. Introduction

Performance measurement is a significant aspect of the business management of any organization. Prior to the 1980s, most organizations adopted financial measures (net profit, return on equity, return on investment, etc.) to assess their performance (Namazi and Abhari, 2010). Nevertheless, several scholars (e.g. Panicker and Seshadri, 2013) argue that financial measures are mostly effective only in the short term and can reveal the performance of the organizations only in the past. In this regard, Zhang and Li (2009) add that the traditional performance management appears to be inadequate in how to measure all-round performance to meet the needs of strategic development. Mainly these reasons motivated Kaplan and Norton (1992; 1996) to suggest the Balanced Scorecard (BSC) as a means to connect performance measures by looking at the business's strategic vision from four diverse perspectives: financial, customer, internal processes, and learning and growth. The financial perspective covers a strategy for growth and profitability from the shareholder perspective. The customer perspective covers a strategy for creating value from the customer perspective. The internal process perspective represents a strategy for producing goods and services in the most efficient way, and the learning and growth perspective includes employee training and corporate cultural attitudes linked with both individual and corporate self-improvement. Within each perspective of the BSC, strategic vision and goals need to be formed and the key performance indicators (KPIs) need to be determined. The KPIs represent performance measures indicating progress toward a desirable outcome and using them an organization can easily define the gap between actual and desired performance.

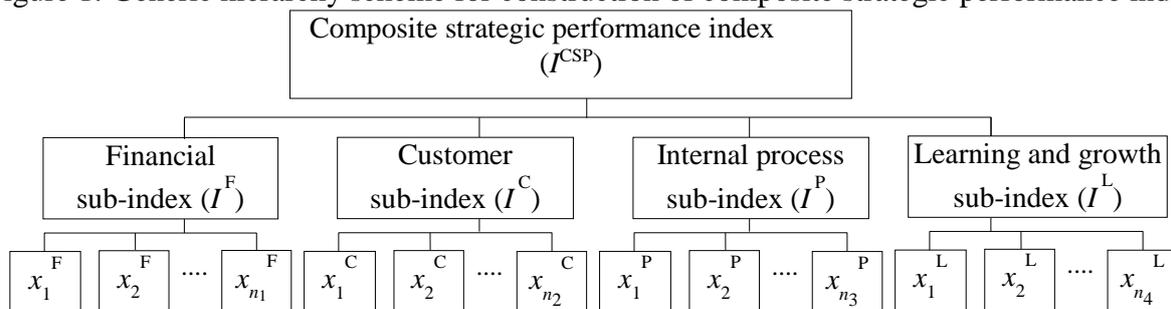
Since the commercial banks are comprehensive, multi-function financial organizations and the BSC focuses on wide range of KPIs in which such these activities are reflected, a number of authors (Balkovskaya and Filneva, 2016; Zhang and Guo, 2015; Öztürk and Coskun, 2014; Panicker and Seshadri, 2013; Todorovic et al., 2012; Wu, 2012; Zhang and Li, 2009, etc.) note the particular relevance of the BSC for banking institutions, as well. In the fast development of financial markets, commercial banks are facing with intense competition and it is difficult to produce differentiated products and services which would attract the customers. Zhang and Li (2009) argue that the BSC can be considered such a qualitative analysis to reveal the potential risks of bank’s operations and can provide great foresight for the future development of the bank.

Since, the BSC is generally based on the monitoring of large number of KPIs, strategic performance measurement becomes a multidimensional problem. The main aim of this paper is to propose a simple methodology for measuring the strategic bank performance based on four perspectives of the BSC approach. We suggested an integrated approach based on the BSC – a multiple perspective framework for performance assessment – and Analytic Hierarchy Process (AHP) – a decision-making tool to prioritize multiple performance perspectives and indicators aiming at support decision makers in identifying the set of KPIs more consistent with the strategic objectives.

2. Research Methodology

Integrated information on strategic performance of a bank is very essential for decision-making since it is very difficult to evaluate the strategic performance on the ground of too many indicators. The proposed methodology reduces the number of KPIs by aggregating them into four sub-indices (I^F, I^C, I^P and I^L) for each perspective of the BSC. The sub-indices are then combined into the composite strategic performance index (I^{CSP}). Figure 1 shows the basic hierarchy of composing indicators into the I^{CSP} .

Figure 1: Generic hierarchy scheme for construction of composite strategic performance index



Source: the author.

The procedure of computing the I^{CSP} is divided into the following steps.

Step 1: Defining the KPIs for each perspective of the BSC

At first, the proper indicators are selected in the financial, customer, internal processes and learning and growth group of KPIs according to the main perspectives of the BSC (financial, $j = F$; customer, $j = C$; internal processes, $j = P$ and learning and growth group of KPIs, $j = L$). For each group j , KPIs whose increasing value has a positive impact (x_i^{j+}) and indicators whose increasing value has a negative impact (x_i^{j-}) in the perspective of strategic performance are considered (See notation in Table 1).

Table 1: Notation used in the definition of KPIs

Group of KPIs	Group notation, j	Number of KPIs in j group*	KPIs with a positive impact	KPIs with a negative impact
Financial	F	$n_1 = n_1^+ + n_1^-$	$x_i^{F+}, i = 1, \dots, n_1^+$	$x_i^{F-}, i = 1, \dots, n_1^-$
Customer	C	$n_2 = n_2^+ + n_2^-$	$x_i^{C+}, i = 1, \dots, n_2^+$	$x_i^{C-}, i = 1, \dots, n_2^-$
Internal processes	P	$n_3 = n_3^+ + n_3^-$	$x_i^{P+}, i = 1, \dots, n_3^+$	$x_i^{P-}, i = 1, \dots, n_3^-$
Learning and growth	L	$n_4 = n_4^+ + n_4^-$	$x_i^{L+}, i = 1, \dots, n_4^+$	$x_i^{L-}, i = 1, \dots, n_4^-$

Note: * For each group j , n_j^+ represents the number of KPIs with positive impact and n_j^- represents the number of KPIs with negative impact.

Source: the author.

Step 2: Normalization of KPIs

The main problem of aggregating KPIs into the one measure of strategic performance is the fact that KPIs may be expressed in different units of measurement (i.e. physical, economic, etc.). One way to solve this problem is normalizing KPIs using appropriate normalization technique. One of the possible options for normalization of KPI is to determine targets for KPIs. A bank needs to set specific targets for each KPI according to the defined mission and strategic vision. Then, in the assessment of strategic performance, the normalization of KPI i with a positive impact could be carried out by the following equation:

$$u_{it}^j = \max \left\{ 0; \min \left\{ 1; \frac{x_{it}^{j+} - x_{it \min}^{j+}}{x_{it \max}^{j+} - x_{it \min}^{j+}} \right\} \right\}, \quad \begin{array}{l} i = 1, \dots, n_j^+, \\ j = F, C, P, L, \\ t = 1, \dots, T, \end{array} \quad (1)$$

and the normalization of KPI i with a negative impact could be carried out by the following equation:

$$u_{it}^j = \max \left\{ 0; \min \left\{ 1; 1 - \frac{x_{it}^{j-} - x_{it \min}^{j-}}{x_{it \max}^{j-} - x_{it \min}^{j-}} \right\} \right\}, \quad \begin{array}{l} i = 1, \dots, n_j^-, \\ j = F, C, P, L, \\ t = 1, \dots, T, \end{array} \quad (2)$$

where u_{it}^j is the normalized value of KPI i for group of KPIs j for time (year) t , $x_{it}^{j+(-)}$ is the actual value of KPI i for group of KPIs j for time t , for the KPIs with a positive impact $x_{it \min}^{j+}$ is the minimum acceptable value and $x_{it \max}^{j+}$ is the maximum and therefore target value of KPI i for group of KPIs j for time t , and for the KPIs with negative impact $x_{it \min}^{j-}$ is the minimum and therefore target value and $x_{it \max}^{j-}$ is the maximum acceptable value of KPI i for group of KPIs j for time t . The equations (1) and (2) ensure that a normalized KPI u_{it}^j will take values from $[0,1]$. In the case of KPIs with a positive (negative) impact the following relationship will be valid: the higher value of the original indicator, the higher (lower) value of normalized indicator. The minimization function in equations (1) and (2) ensures that, if a KPI with a positive (negative) impact is above (below) the target value, the normalized value of KPI is equal to 1, and on the other hand side, the maximization function in equations (1) and (2) ensures that, if a KPI with a positive (negative) impact is below (above) the minimum

(maximum) acceptable value of KPI, then the normalized indicator is equal to 0. This is valid regardless of whether the original (target) values of KPIs are positive or negative numbers.

The main advantage of this standardization is especially the fact that the normalized KPIs directly declare the fulfillment or non-fulfillment of the bank's strategic goals in all four perspectives of BSC. One of the other significant advantages of this standardization is also the fact that a bank can set targets for each reporting period independently. Such process enables a bank to add actual data and thus continuously monitor the progress of implementation of the strategic goals without having to recalculate previous results.

Step 3: Weighting of KPIs

It is further worth noting that bank managers can have different views and can be interested in different KPIs. Therefore, the next procedural part of calculating the I^{CSP} involves determining weights to individual indicators. For this purpose, several methods can be used. To derive the weights of KPIs in our methodology, we select the analytic hierarchy process (AHP) of Saaty (1980). Generally, the AHP consists of pairwise comparisons of indicators with a view to obtaining the order of importance of each indicator. The comparisons need to be made between each pair of KPIs in a given group of KPIs. The comparisons are made by posing the question which of the two indicators k and m is more important with respect to the strategic performance. The intensity of preference is expressed on a factor scale from 1 to 9 (Table 2). The results of pairwise comparisons are gradually written into the Saaty matrix $\mathbf{S}^j = (s_{km}^j)_{n_j \times n_j}$ for $j = F, C, P, L$. The matrix element s_{km}^j recorded in the row k and column m of the matrix expresses how many times the KPI k is more important (significant) than the KPI m .

Table 2: Comparison scale of the AHP

Factor of preference, p	Importance definition
1	Equal importance
3	Moderate importance of one over another
5	Strong or essential importance of one over another
7	Very strong or demonstrated importance of one over another
9	Extreme importance of one over another
2, 4, 6, 8	Intermediate values

Source: Saaty (1980).

In comparing a reciprocal symmetry needs to be maintained, i.e. if the KPI k is more important than the KPI m , then the corresponding element of the Saaty matrix s_{km}^j is equal the relevant factor of preference p , and vice versa, if the KPI k is less important than the KPI m , then the corresponding element of the Saaty matrix s_{km}^j is equal to the reciprocal value of the relevant factor of preference, i.e. $1/p$. It follows from the foregoing that $s_{km}^j = 1/s_{mk}^j$. Moreover, since it is a pairwise comparison of indicators, at the end, it is necessary to check the consistency of each judgment. To this end, for each group of KPIs j , the consistency index CI_j in the form (3) needs to be constructed:

$$CI_j = \frac{\lambda_j^{\max} - n_j}{n_j - 1}, \quad (3)$$

where λ_j^{\max} is the largest eigenvalue of the Saaty matrix \mathbf{S}^j . A consistency index of 0.1 is considered as the acceptable upper limit. If the consistency ratio is greater than 0.1 then the decision-maker has to re-evaluate his judgments in pair-wise comparison matrix until the ratio is finally less than 0.1.

Subsequently, the weights of KPIs $w_1^j, \dots, w_{n_j}^j$ in the group of KPIs j are found using the following nonlinear optimization task:

$$\min \sum_{k=1}^{n_j} \sum_{m=1}^{n_j} \left(s_{km}^j - \frac{w_k^j}{w_m^j} \right)^2 \quad \text{subject to} \quad \begin{aligned} w_1^j, \dots, w_{n_j}^j &> 0, \\ w_1^j + \dots + w_{n_j}^j &= 1. \end{aligned} \quad (4)$$

Step 4: Calculation of indices

With using the weights of KPIs (w_i^j) and normalized values of KPIs u_{it}^j , the sub-indices integrating the relevant KPIs in each group of KPIs j can be derived as a weighted average of the individual normalized KPIs at time t as follows:

$$I_t^j = \sum_{i=1}^{n_j} w_i^j \cdot u_{it}^j, \quad (5)$$

where I_t^j represents the strategic performance sub-index for a group of KPIs j (financial, $j = F$; customer, $j = C$; internal processes, $j = P$ and learning and growth group of indicators, $j = L$) in time (year) t . Since, the normalized KPIs take values from the interval $[0,1]$, also the resulting sub-indices representing the average of them will take values from the interval $[0,1]$.

Finally, the strategic performance sub-indices are combined into the composite strategic performance index I_t^{CSP} as follows:

$$I_t^{\text{CSP}} = \frac{\sum_{j=1}^4 W^j \cdot I_t^j}{\sum_{j=1}^4 W^j}, \quad (6)$$

where W^j denotes the factor representing a priori weight given to the group of KPIs j . Also, in this case the resulting composite index takes values from $[0,1]$. The weights W^j should reflect the relative importance given to the financial, customer, internal processes and learning and growth perspective in strategic performance evaluation and should be determined taking into account the conditions of the bank. For this purpose, an expert estimation or some method for the weight determination (e.g. already used the Saaty method) can be used.

Step 5: Evaluation of the indices development

The evaluation of the development of the composite index I^{CSP} during the period under the consideration should be carried out in connection to the development of individual sub-indices of strategic performance. It holds the higher value of the relevant index, the closer a bank is to achieve its strategic goals.

3. Case Study

The proposed methodology has been tested in a case study. The data have been obtained from the annual reports of Slovenská sporiteľňa, Inc., (Slovenská sporiteľňa, 2010, 2011 and 2012) the largest commercial bank in the Slovak republic servicing 2.3 million clients (Slovenská sporiteľňa, 2016). Slovenská sporiteľňa was established in 1825 as the first savings bank in the Slovak republic. For a long time, it keeps its leadership in total assets, loans, clients' deposits, number of branches and ATMs. It offers its complex services via almost 300 branches and 17 commercial centres in the Slovak republic. Slovenská sporiteľňa offers all respective services and products, from housing financing (mortgages), consumer and corporate loans, personal accounts, payment cards, direct banking services, investment and savings products, consulting and sale of financial market products, private banking services (Slovenská sporiteľňa, 2016).

To track the strategy performance of this case bank, the proposed methodology for the calculation of strategic performance indices was delivered for the years 2010 – 2012. Table 3 lists the KPIs selected for the case bank. The time frequency for the KPIs calculation was the fiscal year. The KPIs have been clustered under four groups covering the financial, customer, internal processes and learning and growth perspectives of the BSC.

Table 3: Description of the KPIs selected for the case bank

Perspective	KPIs	Description
F: finance	(F1) Liquidity ratio	• Total current assets divided by total current liabilities
	(F2) Return on assets (ROA)	• After-tax profit divided by total assets
	(F3) Return on equity (ROE)	• After-tax profit divided by average total equity
	(F4) ROI	• After-tax profit divided by total cost
	(F5) Profit margin	• After-tax profit divided by total operating revenue
	(F6) Leverage ratio	• Total liabilities divided by total assets
	(F7) Operating income-to-assets ratio	• Operating income divided by total assets
C: customer	(C1) Profit per customer	• After-tax profit divided by total number of customers
	(C2) Market share	• Sales volumes of banking products and services divided by total market demands
	(C3) Customer growth rate	• Percentage change in the number of customers
	(C4) Number of branches per customer	• Number of branches per customer
	(C5) Number of ATMs per customer	• Number of ATMs per customer
P: internal processes	(P1) Sales channels development	• Number of transactions through remote channels (Point Of Sale terminals)
	(P2) Number of payment cards	• Total number of payment cards issued over the period
	(P3) Unsuccess of loan policy	• Share of non-performing loans
	(P4) Number of processed processes	• Number of processed processes through Central Back Office Retail over the period
L: learning and growth	(L1) Share of the cost for advisory and consultancy services	• Cost for advisory and consultancy services divided by total cost
	(L2) Share of advertising cost	• Advertising cost divided by total cost
	(L3) Employee turnover	• Number of laid-off and resigned employees divided by total number of employees
	(L4) Employee productivity	• Total operating revenue divided by average number of employees during the period

Source: the author.

For the financial perspective ($j = F$), the KPIs with a positive impact on strategic performance were F1, F2, F3, F4, F5 and F7 and the KPI with a negative impact was F6. For the customer perspective ($j = C$), all KPIs stated in Table 3 were considered as the indicators with a positive impact on strategic performance. For the internal processes perspective ($j = P$), the KPIs with a positive impact on strategic performance were P1, P2 and P4 and the KPI with a negative impact was P3. For the learning and growth perspective ($j = L$), the KPIs with a positive impact on strategic performance were L1, L2 and L4 and the KPI with a negative impact was L3.

To get rid of the influence of different units of measurement of the KPIs, the normalization of the KPIs was performed using equations (1) and (2). In that way the KPIs became combinable and the derivation of the strategic performance indices was possible. For this purpose, the specific targets ($x_{i t \min}^{j+(-)}$ and $x_{i t \max}^{j+(-)}$) for each KPI according to the defined mission and strategic vision of the case bank were set. The targets have been set the same for each t of the years under study.

To determine the weights of the KPIs selected, pairwise comparisons of the KPIs according to their impact to strategic performance evaluation of the bank have been performed. Priorities assumed may vary as to opinion of decision-makers of the bank. The pairwise comparison for each group of KPIs was executed separately. The consistency index for financial, customer, internal processes and learning and growth group of KPIs was 0.05, 0.03, 0.04 and 0.01, respectively. The results about the normalized KPIs and estimated weights are shown in Table 4.

Table 4: Estimated weights and normalized KPIs for the case bank

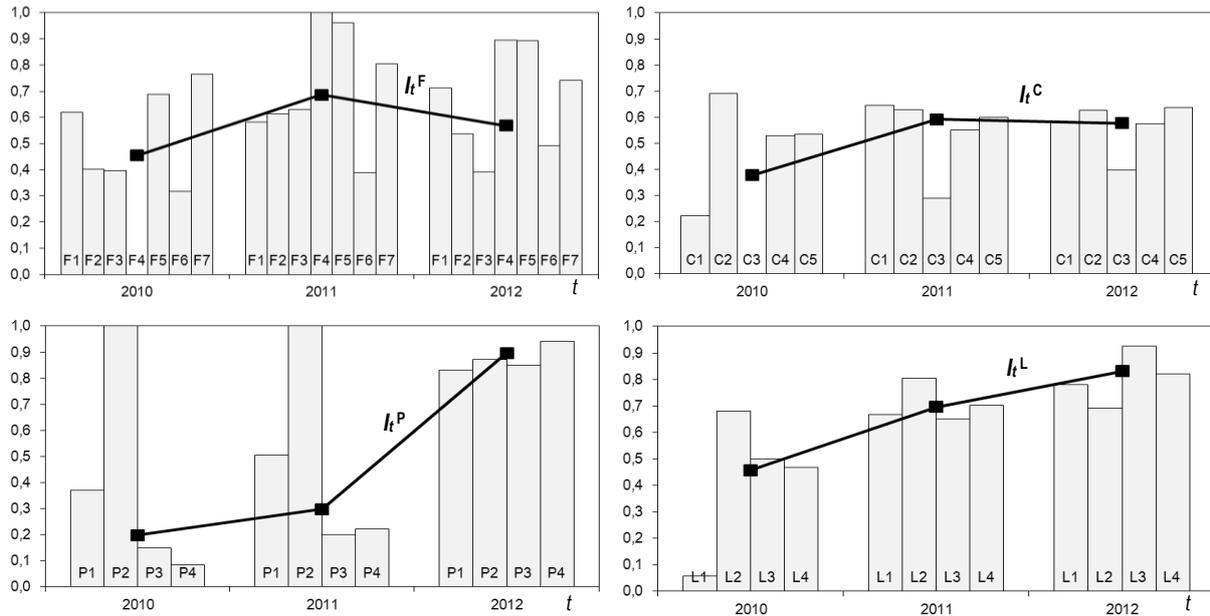
Group of KPIs		$x_{i \min}^{j+(-)}$	$x_{i \max}^{j+(-)}$	Normalized KPIs			Weights w_i^j
				2010	2011	2012	
F: finance	F1	0.100	0.200	0.621	0.582	0.712	0.038
	F2	0.005	0.025	0.401	0.614	0.537	0.274
	F3	0.100	0.250	0.397	0.631	0.391	0.375
	F4	0.250	0.300	0.000	1.000	0.895	0.038
	F5	0.050	0.350	0.688	0.960	0.892	0.158
	F6	0.850	0.950	0.316	0.388	0.492	0.058
	F7	0.010	0.035	0.765	0.806	0.741	0.058
C: customer	C1	0.050	0.110	0.223	0.645	0.581	0.462
	C2	0.150	0.250	0.692	0.628	0.626	0.301
	C3	-0.050	0.050	0.000	0.290	0.398	0.112
	C4	0.00005	0.0002	0.530	0.551	0.576	0.062
	C5	0.0001	0.0005	0.534	0.600	0.637	0.062
P: internal processes	P1	10.000	30.000	0.370	0.505	0.830	0.111
	P2	1,000,000	1,300,000	1.000	1.000	0.871	0.068
	P3	0.060	0.080	0.150	0.200	0.850	0.311
	P4	300,000	900,000	0.083	0.221	0.942	0.511
L: learning and growth	L1	0.001	0.070	0.057	0.668	0.780	0.102
	L2	0.001	0.030	0.681	0.804	0.690	0.102
	L3	0.060	0.100	0.500	0.650	0.925	0.266
	L4	130	155	0.469	0.703	0.819	0.530

Source: the author.

To calculate strategic performance sub-indices in year t ($t = 2010, \dots, 2012$) for each group of KPIs, the normalized value of each KPI was multiplied by its weight. The sum of the

weighted normalized KPIs in each group of KPIs (F, C, P and L) in the year t constitutes a respective sub-index (I_t^F, I_t^C, I_t^P and I_t^L) in a given year t . The resulting sub-indices with the normalized KPIs for each group of KPIs are presented through Figure 2.

Figure 2: The normalized KPIs with sub-indices for financial (I_t^F), customer (I_t^C), internal processes (I_t^P) and learning and growth (I_t^L) perspective of the BSC for the case company

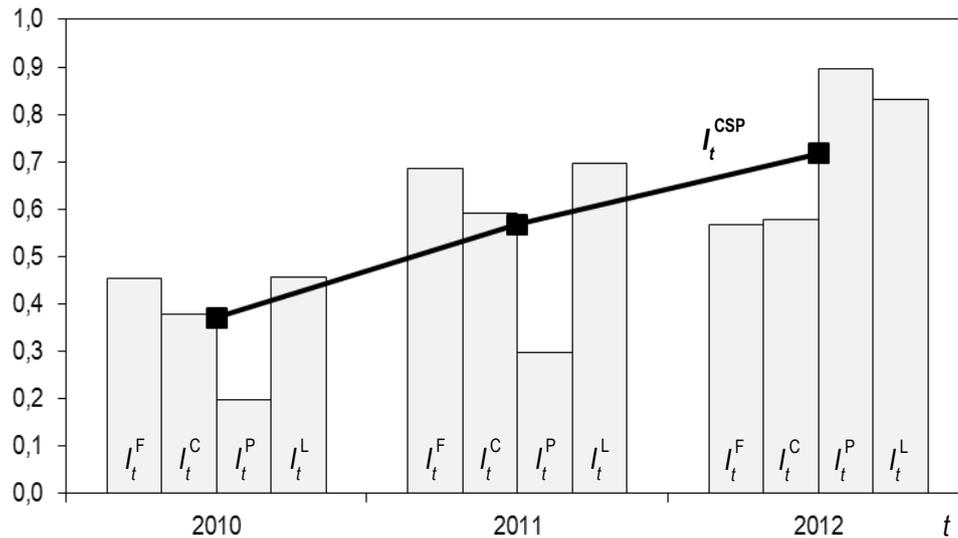


Source: the author.

The last stage of the proposed methodology represents merging of constructed strategic performance sub-indices I_t^F, I_t^C, I_t^P and I_t^L into the composite strategic performance index I_t^{CSP} for each year t using equation (6). In the final calculation of the I_t^{CSP} each sub-index has been multiplied by its weight, which reflects the importance given to the financial, customer, internal processes and learning and growth perspective of the BSC in the case bank. Since in the case bank all perspectives of the BSC are considered to be equally important, equal weights (1/4) have been attributed to each sub-index to derive the composite strategic performance index.

The results graphically illustrated in Figures 2 and 3 enable easy interpretation of the strategic performance of the case bank. The higher is the value of the composite strategic performance index, the closer the bank is to achieve its strategic goals. The same applies to the sub-indices. Following the I_t^{CSP} of the case bank for a time interval 2010 – 2012, it shows that the bank has been improving its strategic performance over the time. During the period, the I_t^{CSP} of the bank had an upward trend and in the year 2012 it reached the highest value (0.72).

Figure 3: The development of strategic performance indices of the case bank over a time interval of years 2010 – 2012.



Source: the author.

However, as can be seen in Figure 2, this positive trend cannot be observed in all perspectives of the strategic performance. Through calculated sub-indices I^F, I^C, I^P and I^L , the bank's performance in the financial, customer, internal processes and learning and growth perspective of the BSC have been evaluated. Within each sub-index wide variations in performance of the case bank are evident. Sub-indices of the internal processes and learning and growth have been increasing throughout the entire period under consideration. The most notable increase can be seen in the sub-index of the internal processes (from 0.299 in 2011 to 0.896 in 2012). In this perspective, the bank recorded a major improvement in P3 (unsuccess of loan policy) and P4 (the number of processed processes). The normalized values of the KPIs P3 and P4 increased over the year 2011 – 2012 from the value 0.200 to 0.850 and from 0.221 to 0.942, respectively. A slightly different situation occurred for the other two sub-indices. Financial and customer sub-indices have been increasing in the period 2010 – 2011 afterwards they have been decreasing. The main reason of decreased financial sub-index in the year 2012 was the worsening of indicators F2, F3, F4, F5 and F7 about 12.6%, 38%, 10.5%, 7.1% and 8.1%, respectively. The greatest deterioration was observed in F3 (ROE). Its normalized value decreased from the value 0.631 in 2011 to 0.391 in 2012 (see Table 4). On the other hand, the main reason of slightly decreased customer sub-index in the year 2012 was the worsening of indicator C1 (profit per customer) and C2 (market share) about 10% and 0.3%, respectively. As Table 4 shows, the normalized values of C1 and C2 decreased from the value 0.645 in 2011 to 0.581 in 2012 and from the value 0.628 in 2011 to 0.626 in 2012, respectively.

4. Conclusion

Since the measurement of strategic performance is based on many financial and non-financial indicators, this paper proposes how to monitor and assess their development in a way that corresponds to the needs of decision-makers. The proposed methodology is based on the construction of the composite index of strategic performance allowing the assessment of strategic performance in four perspectives of the BSC approach: financial, customer, internal processes and learning and growth. To this end, the composite index of strategic performance

is constructed from four sub-indices which reduce the number of KPIs characterizing each perspective of strategic performance into one measure and allow assessing strategic performance from each of four main perspectives.

The paper proposes a step-by-step procedure of grouping various KPIs into the indices for each group of KPIs. The first step consists of defining the KPIs for each perspective of the BSC. The second step proposed the way how to normalize KPIs into comparable scale. For this purpose, targets for each KPI according to the defined mission and strategic vision need to be determined. This constitutes one of the benefits of the proposed normalization because an organization can set targets for each reporting period independently. Such process enables an organization to add actual data and thus continuously monitor the progress of implementation of the strategic goals without having to recalculate previous results. The proposed normalization can be applied to a wide range of indicators regardless of whether the original (target) values of KPIs are positive or negative numbers. Other advantage of this normalization is the fact that the normalized KPIs directly declare the fulfilment or non-fulfilment of the strategic goals in all four perspectives of BSC. To incorporate different views of managers of the importance of KPIs, the next step involves determining weights to individual KPIs. For this purpose, we select the analytic hierarchy process. The last two steps consist of grouping KPIs into the final indices representing the level of achievement of KPIs target values.

The proposed methodology for measuring the strategic performance was illustrated by the example of the commercial bank operating in the economic conditions of the Slovak Republic. The results of the analysis (1) enable easy monitoring the strategic performance of the case bank, (2) point out whether the bank is closer to achieve its strategic goals and (3) draw attention to those areas of the strategic performance that the bank should pay more attention.

Acknowledgements

The support of the grant scheme VEGA [1/0757/15 Augmentation of the theoretical construct of the SCP paradigm and of the efficient structure hypothesis in banking and insurance by the aspect of risk and their empirical validation in the conditions of the Slovak Republic] is gladly acknowledged.

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