



The Balanced Scorecard for public-sector organizations: a practical approach for measuring a public entity performance using financial ratios

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Abstract

To keep public finances healthy in the long term, the operation of public entities requires effective performance of financial resources. The Balanced Scorecard (BSC) is a management tool for senior management born in the business world, which is also used in non-profit organizations, such as public entities. With the purpose to present financial performance in a visual way that gets attention of the viewer and can be quickly understood in one glance to those interested, this paper focuses on the application of the BSC in the public sector: the general balance sheet of a public entity was analyzed and financial ratios were applied to it, concluding with the development of a BSC using a web application, converting the results of the financial ratios into gauge charts, where colors indicate the severity status for each financial ratio. The interpretation of these colors is what you should expect: green indicates an acceptable status, yellow indicate a warning status, and red indicates a severe status. The proposed BSC can be used by auditors or the public entity's administrators to define the area which must be improved to achieve financial goals.

Introduction

The demand of the population for a transparent and effective execution of public spending has motivated the governments of several countries to improve the efficiency in which they provide their services to the population. This trend has materialized in the introduction of the Results Based Budget (RBB) in countries belonging to the Organization for Economic Cooperation and Development (OECD).



The RBB model emerges as a means to improve the way in which governments manage their resources through public entities, in order to consolidate their social and economic development and provide better services to the population (Perez, 2012).

The main objective of public finances is to investigate and structure in which the state or any other public power, such as public entities, obtain the material and financial resources necessary for their operation. The scientific study and the practical application of public finances are a factor of stabilization and economic growth of a country and its companies as centers of decent and fair employment generation, therefore, public finances and policies must seek sustainable business and labor development through effective spending monitoring strategies (Ibarra, 2009).

Public entities are non-profit organizations, whose sole purpose is to satisfy public services by focusing on the collective needs derived from the social organization in which man lives, and are run by people called public servants, who have the obligation to make efficient use of public resources, which are bound by the Federal Law on the Responsibilities of Public Servants (CDHCU, 2012a).

To improve the efficiency with which organizations exercise the resources for their correct functioning, there are several tools, one of which is the Balanced Scorecard (BSC) whose objective is to translate the strategy and the mission of an organization in a coherent set of indicators (González, 2008).

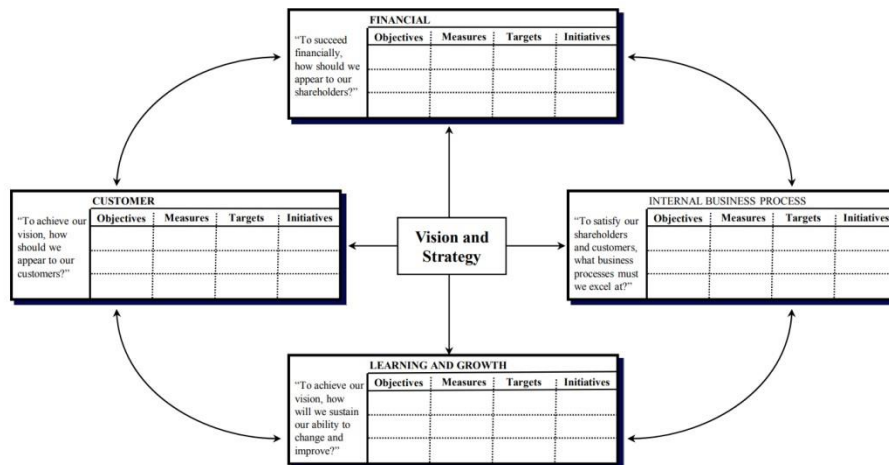
The BSC is a control tool to monitor the performance of the organization. The BSC differs from other Business Intelligence tools, such as Decision Support Systems (DSS) and Executive Information Systems (EIS) in that they are more oriented towards monitoring of indicators that to the meticulous analysis of information. The use of the BSC is commonly carried out by the top management while the DSS and EIS are more focused on departmental management (Sinnexus, 2018).

Kaplan and Norton (1996), the BSC creators, mentioned that financial results are indicators of delay that reports consequences of past actions, so both financial performance measures and non-financial measures should be used to promote the creation of long-term value. The strategic focus of the BSC retains measures of financial



performance, that is, indicators of the results of past actions, and complements them with other key factors that influences performance (see figure 1).

Figure 1. The four perspectives of vision and strategy (Kaplan&Norton, 1996).



The BSC was first introduced back in 1992 in an article in Harvard Business Review article, which in turn was based on an investigation by the Nolan consulting company Norton, on measuring the performance of companies whose intangible assets are central the creation of value. After the publication in 1992, several public, private and non-profit companies adopted the BSC, whose use was extended to a tool to communicate and implement strategies within companies (Kaplan&Norton, 1996).

Kaplan (2010) had the firm belief that measurement is fundamental for both scientists and organization managers, and if managers want to improve the management of their intangible assets, they have to integrate the measurement of intangible assets in their management systems, which gave rise to the development of the BSC. So Developed initially with an approach and use in lucrative companies, the BSC took relevance also in nonprofit companies and public entities, since it helps to keep finances within the budget and communicate the results and future plans to comply with the mission and strategic objectives of the entity (Gonzalez, 2008).

In Mexico as in many other countries in Latin America, the administration of public resources is one of the most criticized issues in public opinion because of bad management. The journalistic investigations and surveys show the deterioration of the administrators of the public entities. Deviations, misappropriation of funds, influence peddling, simulations, among others, are



frequent news in the media. Consequently, the citizens are frequently demanding better management of public resources.

As public entities are obliged by law to do financial statements, they are used to work and report only numbers. As an auditor I have examined several of them, and I have seen the necessity of having better ways to show the results of final reports, so they can be better understood by the administrators and third parties, who are not always experts in the area or do not have the time to read a lot of numbers and text. Therefore a method was developed to show financial performance in a visual way that gets attention of the viewer and can be quickly understood with one glance.

So this paper is focused mainly on the design of a BSC from the financial perspective of a public entity, whose operation results are reported in the financial statements. The results obtained from the financial ratios applied to the general balance sheet were used as the main source of data for the BSC.

For Leach (2010) a ratio is simply one number divided by another, but talking in financial terms, a financial or accounting ratio is one figure from a set of accounts divided by another figure, so when calculating any ratio, one must use the consolidated financial statements; financial ratios are intended to assist the process of identifying some aspect of an organization, such as its profitability, efficiency or liquidity, they can also be early indicators of problems.

Methods

Quantitative analysis is a technique that seeks to understand behavior by using mathematical measurement, aiming to represent a given reality, belonging in the past or future, in terms of a numerical value. Thus a quantitative focus was employed in this paper and included the evaluation of financial information using financial ratios and mathematical operations, in order to understand past events, such as the financial performance of an organization in numerical terms in a given fiscal year.

For Radnitzky (1970) hermeneutics is primarily concerned with the meaning of a text, and the basic question in hermeneutics is: what is the meaning of this text? For Myers (1997) hermeneutics can be treated as both an underlying philosophy and a specific mode of analysis, as a mode of analysis it suggests a way of understanding



textual data. So another method applied in this paper was concerned with using hermeneutics as a specific mode of text analysis, mainly related to mexican laws and financial texts related to financial ratios.

This paper limits the financial perspective of management through the information contained in the financial statements, specifically the general balance sheet. This last is the main source of information from which the mexican supervising bodies use to evaluate the financial performance and situation of public entities.

The financial statements are documents that must be issued by all public, private and non-profit organizations, whose elaboration rules are regulated in Mexico by the Mexican Council of Financial Information Standards (CINIF) and are the initial basis for financial and budgetary audits. Also they are available to the general public for revision and research purposes.

Currently all public entities are bound by the General Law of Transparency and Access to Public Information to publish in the portals of federal and state transparency the information on the way they handle public resources, according to article 49 of the General Law on Transparency and Access to Public Information (CDHCU, 2012b). Likewise, the Law on Fiscalization and Accountability of the Federation in its first and second article (CDHCU, 2016a) determines that the Superior Audit of the Federation may inspect the financial administration of public entities to verify compliance with the Income Law and the Budget of Expenditures of the Federation regarding:

- Public income and expenses.
- The management of public debt.
- The application of federal public resources.
- Other financial, accounting, patrimonial, budgetary and programmatic information of the audited entities
- As well as perform audits on performance to verify the degree of compliance with the objectives of federal programs.

In addition to the foregoing list, the General Law of Government Accounting according to article 46 (CDHCU, 2016b) regarding the accounting systems of the Executive, Legislative and Judicial branches, the entities of the Public Parastatal



Administration and the autonomous bodies, must generate periodically the financial statements and other financial information that are indicated below:

- Statement of financial position
- Income statement / Statement of profit and loss
- Statement of cash flow
- Statement of changes in financial position and
- Statement of variations in public treasury
- Notes on the financial statements

The financial statements are very important for administrators and other interested parties who need to know regularly the performance of a company or public entity. Financial ratios are indicators of financial performance, and are calculated using formulas and their basic inputs are the Profit and Loss Statement, also known as the State of Activities and the General Balance Sheet also known as the Statement of Financial Position (Zutter&Gitman, 2012), both statements are used in public entities in Mexico, this last financial statement is the main focus of this paper.

To illustrate the incorporation of financial ratios in the BSC, the general balance sheet of the State Water and Sanitation Commission (CEAS) as of December 31 2017 was taken as a basis for the development of the BSC. The general balance sheet of CEAS can be found in the transparency portal of the Government of the State of Tabasco in the following link: <https://tabasco.gob.mx/tomo-vii-ceas-tab-2017>

The financial ratios used in the development of the BSC where selected because of their relevance in the public sector, taking into account that public entities are nonprofit organizations; there are other financial ratios that are useful to profit organizations, so profitability ratios were limited to just one, while liquidity and solvency were more emphasized because apart from government fund, public entities are allowed to get other funds, for example by acquiring debt from private banks, so entities must have healthy financial statements.

All numbers are expressed in millions of mexican pesos. The financial ratios used in this paper are as follow:



- Liquidity ratios (see table 1)
 - Quick ratio
 - Current ratio
 - Acid test
- Solvency ratios (see table 2)
 - Debt to equity
 - Debt to assets
- Profitability ratio (see table 3)
 - Return on equity

Table 1. Financial liquidity ratios

FINANCIAL RATIO	HOW TO CALCULATE IT & PUBLIC ENTITY DATA	WHAT IT TELLS YOU	MEANING OF THE RESULT
Quick ratio	= Cash & equivalents of cash / Short term liabilities = 26,537,274.00 / 87,540,650.00 = 0.30	Measures the amount of liquid current assets available per amount of current short liabilities. Liquid current assets are current assets which can be quickly converted to cash, it typically include cash and bank accounts. Quick ratio is expressed as a number instead of a percentage. While current ratio compares the total current assets to total current liabilities, quick ratio compares cash and equivalents of cash current assets with short term liabilities.	A ratio of 1 or more means that cash & equivalents (liquid assets) are more than short term liabilities and the entity does not face any liquidity problem. A ratio below 1 means that short term liabilities are more than current assets, which may indicate liquidity problems in short term.



Current ratio	= Currents assets / Current liabilities = 126,624,351.00 / 120,259,555.00 = 1.05	An indicator that measures the ability to repay current liabilities with current assets. Current assets are assets that are expected to be converted to cash within normal operating cycle, or one year. Current liabilities are	A ratio of 1 or more means that current assets are more than current liabilities and the entity does not face any liquidity problem. A ratio below 1 means that current liabilities are more than current assets, which may indicate liquidity problems. In general, higher
		obligations that require settlement within 12 months.	current ratio is better.
Acid test	= Currents assets – Inventory&Supplies / Current liabilities = 126,624,351.00 – 7,168,055.00 / 120,259,555.00 = 0.99	A harder approach to calculate the quick ratio that involves subtracting all illiquid current assets from total current assets and dividing it by total current liabilities.	An acid ratio of less than 1 means the entity does not have enough liquid assets to pay their current liabilities and it's a sign of warning. If the acid ratio is lower than the current ratio, it means that current assets are highly dependent on inventory&supplies.

Table 2. Financial solvency ratios

FINANCIAL RATIO	HOW TO CALCULATE IT & PUBLIC ENTITY DATA	WHAT IT TELLS YOU	MEANING OF THE RESULT
Debt to Equity	= Total liabilities / Total equity = 120,259,555.00 / 3,057,798,925.00 = 0.0393	An indicator of leverage, it measures the degree to which the assets of the business are financed by the debts and the shareholders' equity of an entity, in this case the government.	A debt-to-equity ratio of 1 means that half of the assets of an entity are financed by debts and half by equity. A value higher than 1.00 means that more assets are financed by debt than those financed by money of equity and vice versa.



Debt to assets	$= \frac{\text{Total liabilities}}{\text{Total assets}}$ $= \frac{120,259,555.00}{3,178,058,480.00}$ $= 0.0378$ $= 3.78\%$	An indicator which measures the debt level of a business as a percentage of its total assets, as a percentage of total assets that are financed by debt, helps assessing whether the entity it is sustainable or not.	A low debt ratio means the organization assets are sufficient to meet its obligations, but also it may indicate underutilization of resources which may result in restricted growth. A high debt ratio indicates high risk for both debt holders and equity investors, so the entity may not be able to obtain alternative funds at good terms or may not be able to raise money at all.
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Table 3. Financial profitability ratio

FINANCIAL RATIO	HOW TO CALCULATE IT & PUBLIC ENTITY DATA	WHAT IT TELLS YOU	MEANING OF THE RESULT
Return on equity (ROE)	$= \frac{\text{Annual net income}}{\text{Equity}}$ $= \frac{44,175,788.00}{3,057,798,925}$ $= 0.0144$ $= 1.44\%$	An indicator of net income of an entity during a year to its equity during that year. It measures the profitability of shareholders' investments, in this case the government. It shows net income as a percentage of the equity.	ROE measures profit which can be translated into efficiency. A high ROE indicates the organization is increasing its ability to generate profit without needing as much equity, additionally it also indicates how well the top management is using the equity.

Results

Table 4 concentrates all the results of applying the financial ratios using the numerical information contained in CEAS's general balance sheet, also called the Statement of Financial Position in the public sector, and explains the interpretation of each ratio regarding the financial performance of CEAS.



Table 4. Interpretation of the results related to the entity financial performance

TYPE OF RATIO	RATIO	NUMERICAL RESULT	INTERPRETATION OF THE RESULT REGARDING CEAS FINANCIAL PERFORMANCE
Liquidity	Quick ratio	0.30	The ratio is below 1, meaning that CEAS's short term liabilities are more than their liquid assets (cash in bank accounts), which indicates liquidity problems, so in case debt owners or other parties decide they want their money, CEAS would not have the necessary cash to pay them.
	Current ratio	1.05	The ratio is above 1, meaning that CEA's current assets (cash, equivalents of cash, accounts receivable and inventory) are more than current liabilities and the entity does not face liquidity problem in the long term.
	Acid test	0.99	The ratio is very close to 1, meaning the CEAS has enough assets to pay their current liabilities (inventory&supplies not included).
Solvency	Debt to equity	0.039	The ratio is way below 1, meaning that CEAS's assets are heavily financed by equity, this happens because it is a public entity.
	Debt to assets	3.78%	The ratio is low, meaning that CEAS's assets are sufficient to meet its obligations, but it also indicates underutilization of CEAS resources which can result in restricted growth.
Profitability	Return on equity	1.44%	The ratio is very low, meaning that CEAS is not efficient in generating new income.

A classic dashboard presentation tool is the gauge chart, that looks like a car speedometer, has a dial and a needle with the needle moving from left to right depending on the value, and is useful for showing levels, but it's not a chart available in Microsoft Excel (Polino, 2013).

It is possible to design gauge charts in Microsoft Excel by constructing a combination chart with a donut chart series and one or more XY scatter chart series, but to accelerate the design of the gauge charts and to simplify its explanation for the purpose of this paper, a free web application was used to get all the gauge charts with minimal effort. The web application can be found in the following link:



<http://www.optixl.com/gauge/index.php>

Gauge charts are visually engaging because they show in a visual and explicit way the degree of compliance or level of each indicator, so that with a simple glance it is possible to define the area which it must be improved to achieve organizational objectives and goals.

Figure 2 shows the parameters of the style configuration and they did not change in all gauge charts.

Figure 2. Style configuration parameters

Style configuration	
Size	Medium (250px) ▾
Contour	Silver ▾
Background	White ▾
Shape	Round ▾
Needle	Arrow ▾
Digital display	Red on Black ▾

Figure 3 shows all the values and scale configurations parameters that were used to feed the web app with the necessary data in order to get the desired gauge chart.

Figure 3. Values and scale configurations of each gauge chart, six in total.

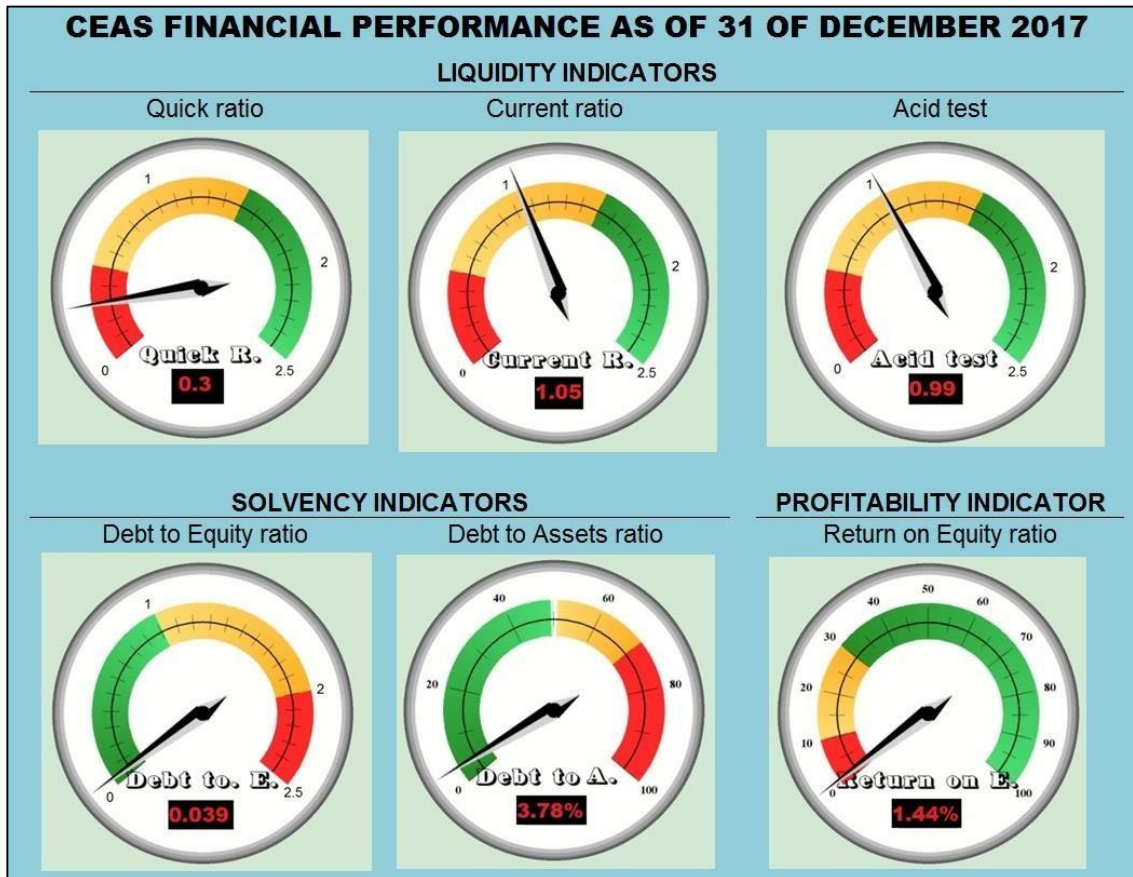
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Each gauge chart (see figure 4) shows the results of the financial ratios applied to the general balance sheet. The gauge charts were downloaded as picture file generated



from the web application. Colors are used to indicate the severity status for each ratio. The interpretation of these colors is what you should expect: green indicates an acceptable status, yellow indicate a warning status, and red indicates a severe status.

Figure 4. Gauge charts.



Quick ratio, current ratio, return on equity ratio and acid test charts begins with red and ends with green, this is because as the value increases in those ratios, the value becomes a better performance indicator.

Debt to equity ratio and Debt to assets ratio begins with green and ends with red, because the less the value, the better the performance indicator is. This happens because of the nature of the financial ratio.



Overall, looking at the BSC it can be said of CEAS that it has mild liquidity problems in the short term (the red in the quick ratio), but in the medium and long term it seems to be stable (the yellows in current ratio and acid test).

In reference of the solvency status, CEAS seems to be stable because in both gauge charts the needles are in the green area, which means safe, but safe does not necessary means efficiency. Because of the nature of debt to equity ratio, it can also be said that CEAS' assets are heavily financed by equity, with a value of 0.039, which is very far from 1. If new debt could be used to finance new operations, meaning a higher debt to equity ratio, CEAS could potentially generate more income than it would have without external financing. If new income is greater than the cost of debt (interest), then the equity could grow, as more income is generate. However, if the cost of debt ends up outweighing the returns that CEAS generates on the debt through investment and operations, the equity may suffer, so the cost of the debt should be handled with caution, because a bad management of debt can lead to failure to pay.

The debt to assets ratio is 3.78%, meaning that there is an underutilization of CEAS resources, this situation has resulted in restricted growth, as seen before, CEAS's assets are heavily financed by equity.

Finally, the percentage of profitability by CEAS reached at the end of the fiscal year of 2017 was 1.44%, which is a very low value. This is partly due because citizens do not always pay their water bill on time to SAS, the entity that collects the payments. In fact there is large amount of debtors in Tabasco, mainly in the municipality of Centro, as in 2017 there was an accumulated debt of 300 million of pesos (Pola, 2017).

Also, the cost of sanitizing and providing water is higher that the income generated by citizens paying their water bill, because as 2018, providing water costs to the public 88 cents by cubic meter, but the real cost is 8 pesos, meaning there is an 90% subsidy (Hernández, 2018).

In conclusion, having a BSC with financial performance indicators that can be easily recognized, if used correctly, it can lead to better strategic planning, improved performance reporting and improved strategy communication and execution, as their creators Kaplan and Norton intended so.



Table 5 shows an example of how the results of the financial ratios shown in the gauge charts can be adapted to the BSC perspectives model proposed by Kaplan and Norton, where the public entity administrators must decide what targets and initiatives must take in order to achieve their financial goals.

Table 5. Adapting the results of financial ratios in the financial perspective of the BSC.

OBJECTIVE	MEASURES	TARGETS	INITIATIVES
To improve Liquidity	Quick ratio Current ratio Acid test		
To improve Solvency	Debt to equity Debt to assets		
To improve Profitability	Return on equity		

It is appropriate to clarify that this paper does not propose to limit the use of BSC only to the general balance sheet, as others financial ratios can be applied to the statement of profit and loss, so in order to develop a broader understanding of BSC in the public sector, it is necessary to extend this study further at other financial statements and to investigate how other types of indicators used in public administration can be incorporated in the different BSC perspectives and how they are linked with the entity performance.

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