

# The Impact of Applying Balanced Scorecards on Increasing the Operational Efficiency of Activities in Manufacturing Companies

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## Abstract

The study aimed to measure the impact of applying six dimensions of balanced-scorecards (BSCs) on two elements representing the operational efficiency of activities in Syrian manufacturing companies. The independent variable was measured through dimensions of BSCs, namely, financial perspective, internal business perspective, customer perspective, learning and growth perspective, social perspective, and the risk perspective, and thus divided into two groups: financial and nonfinancial dimensions of two types of balanced-score cards – the company's BSC and the individual's BSC. The dependent variable, namely, the operational efficiency (OE) was measured by two elements: operational cost reduction and informal reports of two Syrian manufacturing companies located in the City of Damascus. The study adopted a descriptive and analytical approach and a questionnaire form was designed and distributed to participants of planning managers, cost accountants, financial managers, production managers, marketing managers, internal auditors, and general managers, who are working in these companies. The researcher used a descriptive and inferential statistical analysis to measure the impact of the independent and dependent variables of the study.

The study results showed the following:

1. based on the descriptive statistical analysis participants perceived the application of BSCs as between moderate to high levels (average results were between 2.33-5) with the conclusion that employees and managers perceived the importance of BSCs to translate the company's strategy and achieve predetermined objectives, despite difficulties associated with the application of BSCs in manufacturing companies.
2. based upon inferential statistical results (HO-1) there was a significant impact of applying BSCs on increasing operational efficiency in manufacturing companies in Syria. The conclusion is characterized by the need to apply BSCs to get their benefits not only in applying the integrated six dimensions but also to support control and auditing systems in manufacturing companies.
3. the regression results also showed (HO-1-1) that there was a significant impact of applying BSCs on operational cost reduction in manufacturing companies in Syria. The conclusion is that the efficiency and effectiveness are important elements in companies and can be improved by the application of the BSCs for the company and for its individuals.
4. the regression results showed (HO-1-2) that there was no significant impact of applying BSCs on informal operational reports in manufacturing companies in Syria. The conclusion is that informal reports and practices were perceived differently by the middle and top management and smart managers dealt with informal practices for the benefits of formal practice and therefore expanding the database of formal procedures within the BSCs.
5. results showed that there were differences (HO-2) of the impact of applying BSCs on increasing operational efficiency in manufacturing companies in Syria attributed to the academic and professional experience factor. The conclusion is characterized in focusing on intensive employees training programs and operational experience as a need to the application of the BSCs in manufacturing companies.

In line with these findings, the researcher recommended the following:

1. more studies are needed on the application of the company's BSC and the individual's BSC on other different manufacturing and service companies with impacts on profitability, cash flows, and liquidity using different research methods: such as questionnaire forms and the content analysis.
2. adopting regular and continual training programs for different managerial levels in manufacturing companies to understand the application of the BSCs in these companies.
3. the need to discover new cases to identify areas of cost reduction for manufacturing companies to enhance performance effectiveness and efficiency of activities based on the application of BSCs, as done in this search.

**Keywords:** Balanced Scorecards, Operational Efficiency, Syrian Manufacturing Companies.

## 1. Introduction

The world today witnesses a great economic, financial and social problems resulted in many failures,

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bankruptcies, and the lack of liquidity for many businesses around the world<sup>1</sup>. In addition, there are many factors causing difficulties facing businesses, such as the absence of efficient operational control and ineffective tools for performance evaluation that are considered the core of success or failure of these businesses<sup>2</sup>. Many researchers called for more studies to discover factors that affect decision making processes and there is a need to adopt new approaches and tools to develop new operational control procedures to achieve predetermined objectives<sup>3</sup>. Further, a well-designed internal control and auditing systems must be linked with all financial and nonfinancial performance evaluation approaches to which new tools of management are directed towards increasing operational efficiency of activities in organizations<sup>4</sup>. Moreover, managers usually use the available performance evaluation tools with no efforts to develop these tools in accordance with changing circumstances, leading to dysfunctional performance results<sup>5</sup>.

Another line of studies pointed out that companies are interested in issuing formal procedures to increase efficiency in operational processes by linking activities with control systems, budgeting, social environment, and predetermined targets in manufacturing companies<sup>6</sup>. The economic perspective also supported this line of study by providing policies and procedures to maximize the wealth growth of stakeholders, based on transparency and disclosure standards<sup>7</sup>. Others stated that the elements of control systems within organizations cannot be isolated from external factors imposed on systems of companies<sup>8</sup>.

Management at the middle level usually use traditional performance measures, such as formal financial performance reports, however, some of which are interrelated with modern performance measures, such as balanced scorecards, that include both financial and nonfinancial performance reports<sup>9</sup>. Balanced scorecards are considered one of the most effective performance evaluation measures that link different elements of control, accounting, management, financial, nonfinancial, short-term operations, and strategic organizational systems, and systematic and unsystematic risks facing organizations<sup>10</sup>. Further, balanced scorecards for the company and for individuals can make a balance between long-term and short-term objectives, leading to integrations between yesterday, today and tomorrow data that help in achieving organizational and employees objectives<sup>11</sup>. Moreover, balanced scorecards can lead to efficient operational processes by enhancing operational auditing and control procedures causing cost reduction and efficient use of available resources because balanced scorecards focus on financial auditing, employees benefits, clients satisfaction, risk avoidance and external environments in

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<sup>1</sup> Rapp, Marc Steffen, (2010), Information Asymmetries and the Value-Relevance of cash Flow and Accounting Figures-Empirical Analysis and Implications for Managerial Accounting, *Center for Entrepreneurial and Financial Studies (CEFS)*, TUM Business School- Technische Universität München, April 2, pp: 1-25.

<sup>2</sup> Whittington R., and Delany, P., (2013), "Wiley CPA Examination Review: outlines & Study Guide", 39th edition, John Wiley & Sons Inc., p. 77, USA.

<sup>3</sup> Judeh, Abed Alhakim Mustafa, Muhammad Khalil, Nimer, Khraisat, Ula, (2011), The Extent of Using Management Accounting Approaches in Jordanian Manufacturing Listed Companies- A Survey Study, *Economic and Management Journal*, No.1, (37), pp:13-37; Kaplan, Robert S. & Norton, David P.(2001),"Transforming the Balanced Scorecard from Performance Measurement to Strategic Management : Part 1", *Accounting Horizons*, pp: 52-63.

<sup>4</sup> Gill, A., and Obradovich, J., D., (2012), The Impact of Corporate Management Control and Accounting Systems and Financial Leverage on the Value of American Firms, *International Research Journal of Finance and Economics*, ISSN 1450-2887 Issue 91, Euro Journal Publishing, Inc. pp: 1-14.

<sup>5</sup> Al-Halabi, N., "The Role of Management Control and Accounting Systems in Increasing the Efficiency of Activities of Manufacturing Companies", the International Institute for Science, Technology and Education (IISTE), *European Journal of Business and Management*, Vol. 5, No. 13, 2013, pp: 147-158, UK; Öztürk, Elif and Coskun, Ali, (2014), "A Strategic Approach to Performance Management in Banks: The Balanced Scorecard", *Accounting and Finance Research*, Vol. 3, No. 3; PP:151-158.

<sup>6</sup> Hilton, R., (2008), *Management Accounting-Creating Value in A Dynamic Business environment*, McGraw-Hill Publications, PP: 230-232, USA.; Kaplan, R. and Norton, D., (1996), "using the balanced scorecard as a strategic management system", *Harvard Business Review*, January– February, P. 76.

<sup>7</sup> Barth, M., E., and Landsman, W., R. (2010), How did Financial Reporting Contribute to the Financial Crisis?, Forthcoming, *European Accounting Review*, Electronic Copy Available on line at: <http://ssrn.com/abstract=1601519>, pp: 1-7.

<sup>8</sup> Kalle, Kraus, Johnny Lind,(2010). "The Impact of The Corporate Balanced Scorecard On Corporate Control –A Research Note", *Management Accounting Research*, Vol. 21, No. 4, PP: 265–277.

<sup>9</sup> Kadarova, J., Durkacova, M., Kalafusova L., (2014), "Innovative approaches to the modification of BSC model", (Procedia-Social and Behavioral Sciences); Kaplan, Robert S. & Norton, David P., (1993), "putting the Balanced Scorecard to work", *Harvard Business Review*, p. 61.

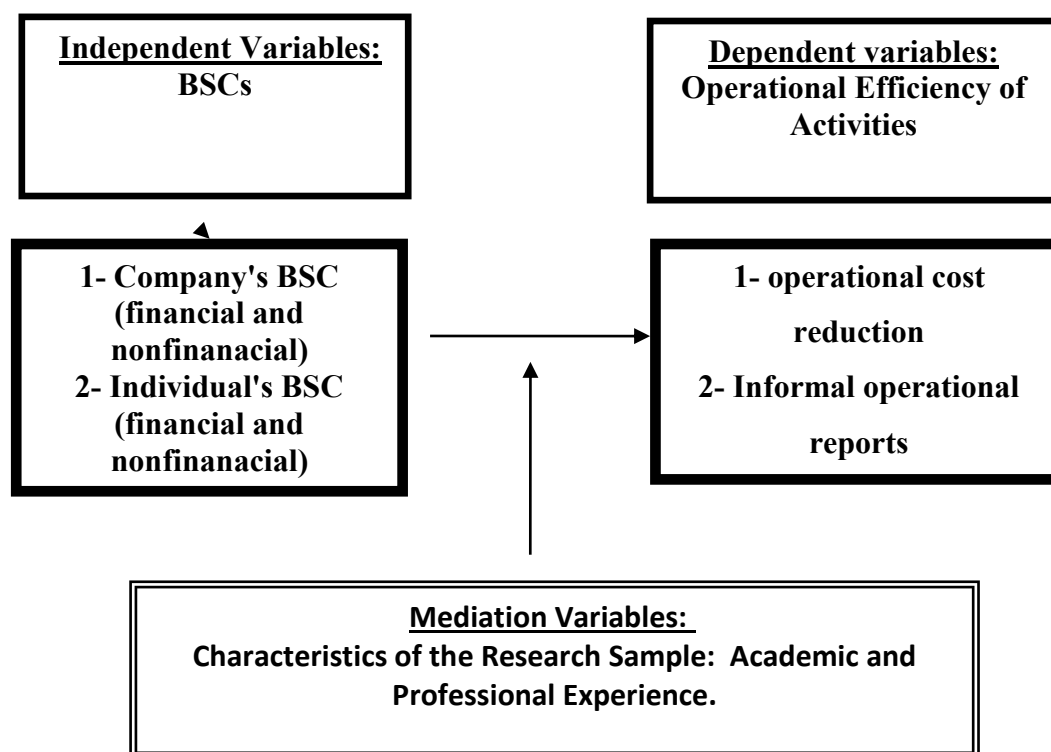
<sup>10</sup> MdZin N., Sulaiman S., Ramli A., Nawawi A., (2013), "Performance Measurement and Balanced Scorecard Implementation: Case Evidence of a Government-linked Company", (International Conference on Economics and Business Research 2013, Volume 7).

<sup>11</sup> Gorzen-Mitka, I., Okreglicka, M., "Improving Decision Making in Complexity Environment", (Procedia Economics and Finance, 2014), Available online at [www.sciencedirect.com](http://www.sciencedirect.com).

dynamic businesses<sup>1</sup>. This is agreed by prior studies where the environments of modern businesses and fast technology have pressures on companies to adopt modern tools, techniques and approaches that facilitate the achievement of a competitive advantage and the customer satisfaction<sup>2</sup>.

Recently, many researchers called for more studies to apply modern management tools and techniques in businesses that can affect the company's strategy, operational performance and develop new controls and procedures to achieve predetermined objectives<sup>3</sup>. Other studies focused on control tools to improve current performance measures and providing continuous disclosures on performance evaluation reports for stakeholders<sup>4</sup>.

**Figure (1)**  
**The Research Framework\***



\*Middle Level Managers of activities: planning, purchasing, selling, financing, controlling, cost accounting, and warehousing.

\*Other Management Levels: CEO, and Deputy CEO.

The research focused on exploring the impact of BSCs on operational efficiency in manufacturing companies in Syria, as shown in figure (1).

## 2. Objectives of the research

The following are objectives of this research:

1- identifying the impact of applying BSCs on operational efficiency of activities in manufacturing companies in Syria.

2- studying management perceptions and attitudes towards agreement and difficulties of applying the BSCs, and testing hypotheses based on the analytical-descriptive approach with questionnaire forms distributed to sampling units.

<sup>1</sup> Kadarova, et. al. Op cite.p.37.

<sup>2</sup> Kaplan, R. & Atkinson, A. (1997). *Advanced Management Accounting*, Third Edition, Prentice-Hall international Inc., USA.; King, A., (2001), *The Current Status of Activity Based Costing Management Accounting*, 2 Edition,p:-24-30, Thomson Learning.

<sup>3</sup> Kwang Mo Yang, Young Wook Cho, (2010), "A Study on Development of Balanced Scorecard for Management Evaluation Using Multiple Attribute Decision Making Applications", Software, Engineering, & Online.; Salterio, S. (2012). "Balancing The Scorecard Through Academic Accounting Research: Opportunity Lost?" *Journal of Accounting & Organizational Change*, Vol.8 No.4,PP: 458-476.

<sup>4</sup> Rapp, Op. Cite, p. 5; Dorgham, T., Al-Halabi, N., Shanikat, M., The Impact of Management Control Systems Limiting Fraudulent Practices in Manufacturing Companies", *the International Institute for Science Technology and Education -in European Journal of Finance and Accounting(IISTE)*, Vol. 5, No. 6, 2014, pp: 1-14, U.K.; Hilton, Op. Cite, p.235.

3- identifying differences from the points of view of the company and its individuals using BSCs, and bridging the gap between the company's BSC and the individual's BSC to find out how to increase operational efficiency and integrated informal reports into formal reports in line with the company's strategy and its objectives in manufacturing companies in Syria.

### 3. Research Latitude

Based upon the management accounting literature, this study identified ways of increasing operational efficiency and cost reduction by applying BSCs in two Syrian manufacturing companies located in the City of Damascus. The independent variable was measured through dimensions of BSCs, namely, financial perspective, internal business perspective, customer perspective, learning and growth perspective, social perspective, and the risk perspective, and thus divided into two groups: financial and nonfinancial dimensions of two types of balanced scorecards – the company's BSC and the individual's BSC. The dependent variable, namely, the operational efficiency (OE) was measured by two elements: operational cost reduction and informal reports. There is little evidence on the impact of applying BSCs in manufacturing companies in Syria, and accordingly, attempts were made to create ideas on the extent on which such a modern tool may have impacts on the operational efficiency of activities by expanding the content of formal procedures to support the company's strategy and achieving economic decisions in these companies.

### 4. Literature Review

The management accounting literature disclosed a set of modern tools to develop current performance measurements relying on quantitative and qualitative criteria to support economic decisions, thus, achieving a balance between what the top management and owners are aiming to achieve and individual objectives<sup>1</sup>. Actually, balanced scorecards relied on a two detailed-phase approach, the first phase identifies financial and nonfinancial activities that add values to the company, followed in the second phase by identifying quantitative and qualitative performance measures taking into account the nature of the activity's work, its classification, qualified individuals responsible in running the activity, predetermined goals, clients satisfaction, and factors affecting the company's environments<sup>2</sup>. Balanced scorecards as a part of the management control system is overcoming the problem associated with translating the company's strategy and its linking with the individual's own strategy<sup>3</sup>. Moreover, balanced scorecards have, through their comprehensive dimensions, the ability to link and apply modern costing tools such as the activity-based costing and target costing on the basis of market research to achieve sound pricing decisions<sup>4</sup>. For example, the internal operational perspective of BSCs can result in efficient costs (by adopting the target costing approach) that are used as a major part of the price distinction, leading to clients satisfactions, more profit margins, more market penetration, and competitive advantages<sup>5</sup>. Actually, integrating the BSCs with other modern tools such as the Kaizen approach proved to have cost reduction through the comparison between the initial cost and the target cost, and increasing profitability in manufacturing companies<sup>6</sup>. Some researchers went further to focus on internal operational activities of companies by applying the Kaizen approach to control operational activities, to which the continuous reduction in costs can be achieved through the difference between the initial cost and the target cost, leading to increases in profitability and competition<sup>7</sup>. The interaction between different specialized dimensions of BSCs and related elements, that is, prices, costs, risks and strategies is important to achieve predetermined objectives<sup>8</sup>. It is also noted that external parties, such as customers, governmental, and environmentalists whether they are dealing

<sup>1</sup> Kaplan, Robert S. & Norton, D.,(1992),"The Balanced Scorecard: Measures that Drive Performance", Harvard Business Review. 57.; Drury, Colin, (2004), *Management Accounting For Business*, 6th.Ed, p:9, Bath : Thomson, UK.

<sup>2</sup> Garrison, R., Noreen, E., Brewer, P., (2006), *Management Accounting*, 11<sup>th</sup> Ed., Pearson.; Schwartz,J.(2005) " The Balanced Scorecard Versus Total Quality Management: Which Is Better for your Organization "; Gumbus, A., Lyons, B., "The Balanced Scorecard at Philips Electronics", (strategic Finance, vol.84, Issue 5, November 2002).

<sup>3</sup> Kwang, et.al. , Op. Cite, p. 22.; Kaplan, and Atkinson, Op. Cite, p. 58.

<sup>4</sup> Shimizu ,K.,(2013),*Transforming Target Cost at Toyota*, Okayama University, Retrieved from <http://www.e.okayama-u.ac.jp/~kshimizu/downloads/iir.pdf>; Negulescu, O., Doval E., "The quality of decision making process related to organizations effectiveness", (Procedia Economics and Finance, 2014).

<sup>5</sup> Swenson, D . And Ansari.(2010). Best Practices in Target Costing, *Management Accounting* ,Vol (2), No (1), pp: 12-15.

<sup>6</sup> Garrison, Noreen, and Brewer, Op. Cite, p.72.; Adams, Steven J. Pryor, Leroy J. Keller, Donald E, and Harston,Mary E. (2010). *Management Accounting Information* ,South-Western College Publishing,ed 4<sup>th</sup>,p:334, U.S.A.; Kadarova, Durkacova, and Kalafusova Op. Cite, p. 38.

<sup>7</sup> Shiozawa, Y.,(2006). Economic and Accounting. A comparison Between Philosophical Background of Two Disciplines in View Complexity Theory, *Accounting, Auditing & Accountability Journal*, Vol. 12, No. 1, p19-51.; Ala'a & Noor ( 2010) " Developing Measurement Mathematical Model In Management Change and Strategic Planning Using BSC Perspectives".

<sup>8</sup>Kwang, et.al. , Op. Cite, p. 24; Wiersma E., "for which purposes do managers use BalancedScorecards? An Empirical Study" *Management Accounting Research*, Volume 20, No 4, 2009).

directly with the company or who are benefitting from its services are included into the clients dimension, the social dimension, and the risk dimension of BSCs in manufacturing companies<sup>1</sup>.

The researcher believed that integrated dimensions of BSCs can not be effectively achieved without the top management support in integrating the company's BSC with the individual's BSC in manufacturing companies in Syria.

## 5. Research Problem

Many manufacturing companies used current traditional performance evaluation measures in isolation of other management tools, such as balanced scorecards BSCs. This led to difficulties in providing relevant information for economic decisions. Moreover, there are problems of mismatching between the current practices of traditional performance evaluation measures and the formal framework of the BSCs and the inefficient allocation of resources within manufacturing companies. As a result, cost may not be reduced indicating lower profitability and poor operational performance that affect the quality of services in manufacturing companies, ending up with unsound economic and investment decisions. Accordingly, the whole economy will be negatively affected by such decisions leading to instability in economic activities at micro and macro levels.

Thus, the main problem of this research is presented to answer the following main and sub-main questions:

Q.1- what is the impact of applying BSCs (with the integrated six dimensions) on operational efficiency (operational cost reduction and informal operational reports) in manufacturing companies in Syria?

1-1 what is the impact of applying BSCs (with the integrated six dimensions) on operational cost reduction in manufacturing companies in Syria?

1-2 what is the impact of applying BSCs (with the integrated six dimensions) on informal operational reports in manufacturing companies in Syria?

Q.2- what are differences of the impact of applying BSCs (with the integrated six dimensions) on operational efficiency (operational cost reduction and informal operational reports) in manufacturing companies in Syria attributed to academic and professional experience?

## 6. Research Methodology

The research relied on a descriptive and analytical method, and accordingly, the research was divided into two parts: the first part was theoretical by discussing and analyzing the related literature of balanced scorecards; and the second part was analytical by studying areas of increasing operational efficiency, based on: (I) the research hypotheses and (II) research method.

### 6.1 Research Hypotheses

The research hypotheses are as follows:

1- H01 there is no significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on increasing operational efficiency (operational cost reduction and informal reports) in manufacturing companies in Syria.

2- H01-1 there is no significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on operational cost reduction in manufacturing companies in Syria.

3- H01-2 there is no significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on informal operational reports in manufacturing companies in Syria.

2- H02 there are no differences of the impact of applying BSCs (consisted of six dimensions) on increasing operational efficiency (operational cost reduction and informal operational reports) in manufacturing companies in Syria attributed to the academic and professional experience.

### 6.2 Research Method

A pilot study was done through short visits to the sample in study where main questions were presented and discussed with participants of two manufacturing companies to have an idea of whether there is a possibility to apply BSCs. Most manufacturing companies were still using traditional performance evaluation measures, but they are willing to apply new techniques that control costs in changing business conditions facing Syria nowadays. The research method represented the research population and sources of data gathering, from which a sample of sixty five participants were selected, that is: fifty executive managers located at the middle level, and fifteen participants of CEO, deputy CEO, top planners and BOD members, who are working in the middle and top management levels and their related activities in two manufacturing companies located in Syria. A statistical questionnaire form that includes questions of the research objectives presented to the research participants, as shown in Table (1).

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<sup>1</sup> MdZin, Sulaiman, Ramli, and Nawawi, Op. Cite, p. 26.



**Table (1)**  
**Distribution of the research sample and percentage of response**

Participants in two manufacturing companies distributed as follows:	Executive managers	CEO, owners and members of BOD	Total
1- CEO, deputy CEO, planners, and members of BOD	--	20	20
2- production, purchasing, selling, financing,controlling, cost accounting, and warehousing.	60	--	60
total	60	20	80
No. of Responses	50	15	65
% of Responses	83.33%	75 %	81.25 %

Furthermore, statistical tests for the research sample were applied on (i) the independent variables of the BSCs: six dimentions: financial (such as return of assests – ROA-, return of investment-ROI-, and profit margins), internal business, cumtomer, learning and growth, social, and the risk perspective, thus, these six dimentions are divided into two groups: financial and nonfinancial dimentions of two types of balanced scorecards – the company’s BSC and the individual’s BSC; and (ii) dependent variables of operational efficiency (OE): was measured by two elements: operational cost reduction and informal reports of two Syrian manufacturing companies located in the City of Damascus. The focus was on the research participants who hold professional and academic experience (minimum of five years).

### 6.3 Research Statistical Techniques

Based on the computerized coding system for all research independent and dependent variables, the statistical package for social sciences (SPSS) were used to run the following descriptive and inferential statistics:

- 1- Descriptive statistical analysis and normal distribution measures applied on independent and dependent variables, such as Means and standard deviations, in order to know the highest (average between 3.66 to 5), the moderate (average of 2.33 to lower of 3.66), and lowest (average of one and lower than 2.33) observations.
- 2- Simple regression tests to find out the impact of each individual variable of the chosen independent variables on dependent variables.
- 3- Multiple regression tests to find out the impact of each group of independent variables on dependent variables, and the impact of each group of independent variables on each element of the dependent variables.

## 7. Research Results and Discussion

An introduction and simplified explanation were made in the questionnaire form on the six dimentions of balanced scorecards (BSCs) and their linked performance procedures to increasing the operational efficiency (OE) of activities of production, purchasing, marketing and planning departments of two selected Syrian manufacturing companies. This was followed by presenting the importance and difficulties of applying BSCs for the company and for its individuals, focusing on their importance in areas of increasing operational efficiency in terms of cost reduction, customer satisfaction, and competitive advantages..

Table (2) summarizes results on importance and benefits of applying the BSCs at the company level and its individuals of operational activities in manufacturing companies. The item of “BSCs as a tool of performance evaluation” and “ the company's BSC as a tool of transalting the company's strategy in terms of short and long terms” (the highest ranking level of 5; and raking 5 with a mean of 3.95 and SD of 0.99 %; and 3.88 and SD of 0.85 %) are perceived as more important, especially for the company's BSC, than for the individual's BSC (ranking levels of 3 and 4). The conclusion extracted from participants' perceptions that every dimension of the BSC whether for the company or its individual is equally important, otherwise distortions of effeiciency are exisited and the company strategy and predetermined objective cannot by fulfilled.

**Table (2)**  
**Importance of applying the BSCs at the company level and**  
**Individuals in operational activities of manufacturing companies**

Items in the questionnaire	Ranking*	Mean	SD %	R Square%
1- BSCs provide performance indicators aiming at achieving the company's strategy by applying operational procedures and variances for activities of production, marketing, purchasing that enhancing operational efficiency and cost reduction.	5	3.95	0.99	0.25
2-The company's BSC divides the company strategy into short-term financial plans to increase sales revenues and helps identifying nonfinancial plans to achieve clients satisfaction (measured by the no. of distinguished clients).	5	3.88	0.85	0.22
3- BSCs reduce informal practices and increases operational efficiency at work.	4	2.91	0.61	0.21
4- The individual's BSC can benefit from social programs, improving level of living, and employment opportunities for more added values activities within the company.	4	3.01	0.72	0.24
5- The individual's BSC helps in increasing loyalty by reducing waste, maintaining day-to-day operations, and stability at work.	3	3.03	1.06	0.35
6- Applying BSCs can lead to better CVP estimates and reduce specific-company risks and uncertainty.	3	3.08	1.26	0.41

\* Ranking is based statistically on means at 5% significant level and the range of Likert scale from no. 1 not important to no. 5 which is so important.

Table (3) summarizes results of participants agreement on developing procedures based on BSCs to increase efficiency and cost reduction in manufacturing companies. Results indicated that participants agreed on the existence of problems of cost inflation and weak efficiency of activities and there is a need for a framework that integrate financial and nonfinancial indicators to tackle such operational problems in manufacturing companies. This is done through: 1- building up a formal framework of the company's BSC to include equally-important dimensions for all functions and activities of manufacturing companies. This is done by organizing and unifying additional financial and nonfinancial information for each activity within the formal procedures and reports (e.g: special reports, informal reports, and inefficiency in operational activities- Table 3); 2- building up a formal framework of the individual's BSC to increase operational efficiency of activities and environment risks facing manufacturing companies and reformulating procedures to include individuals benefits into main activities such as planning, production, marketing, finance, HR, and auditing activities; and 3- integrating the above-mentioned two BSCs through top management support and participation by the middle levels of management with those in lower level of management in manufacturing companies (raking levels of 4 and 5 for all items of questionnaire in Table 3).

**Table (3)**  
**Participants' agreement on developing procedures based on BSCs**  
**to increase efficiency and cost reduction in manufacturing companies**

Items in the questionnaire	Ranking*	Mean	SD %	R Square %
1- special and informal reports are not included into BSCs so that additional financial and nonfinancial data are not increasing efficiency of activities.	5	3.91	0.70	0.18
2- performance evaluation reports on marketing, production and warehousing activities are leading indicators since they rely on future financial performance and support the company's strategy.	5	3.89	0.74	0.19
3- informal reports such as wastage and damage at work could increase operational efficiency of production activities when they are included into the framework of BSCs.	4	3.73	0.97	0.26
4- environmental indicators such as risks and social events included into the framework of BSCs lead to more market penetration of the company strengthen its strategy in the short and long terms.	4	3.64	1.06	0.29

\* Ranking is based statistically on means at 5% significant level and the range of Likert scale from no. 1 not important to no. 5 which is so important.

## 7.1. Testing the Research Hypotheses

### 7.1.1. Testing main and sub-main hypotheses of the research

H0-1: there is no significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on increasing operational efficiency (operational cost reduction and informal reports) in manufacturing companies in Syria, as referred to in Table (4).

Table (4)  
 Regression results on applying BSCs on increasing operational efficiency

Sig.	R <sup>2</sup>	R	F	H0-1
.000	0.251	0.501	21.499	Rejected

There were benefits on the application of BSCs, some of which were perceived in manufacturing companies, as follows: (i) having the company's BSC information extracted from all activities in one periodical report, top management could see the whole picture of activities' performance and evaluated the competitive strategy of the company; (ii) BSCs were able to translate the company's vision and its strategy in integrated and measurable financial and nonfinancial performance indicators; (iii) BSCs helped the management of human resources through promoting employees and individuals towards achieving the required performance at work ; (iv) by introducing nonfinancial indicators, BSCs improved control systems; (v) BSCs, whether for the company or its individuals, included many balances between long and short term objectives, financial and nonfinancial measures, internal and external measures; (vi) based on BSCs reports current and future decisions were improved; (vii) BSCs had strong coordination between activities in manufacturing companies; (viii) the ability of BSCs to accommodate quickly and effectively to rapid changes in operational activities; (ix) BSCs can identify duties and responsibilities for every individual within the company at all management levels in manufacturing companies.

Accordingly, table (4) showed the regression results of the main hypothesis, thus the H0-1 is rejected in that there is a significant impact of applying BSCs (consisted of six dimensions) on increasing operational efficiency (operational cost reduction and informal reports) in manufacturing companies in Syria ( $F = 21.499$  and  $\text{sig} = 0.000$ ). This result is consistent with Wiersma, 2009.

H01-1 there is no significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on operational cost reduction in manufacturing companies in Syria, as referred to in Table (5).

Table (5)  
 Regression results on applying BSCs on operational cost reduction

Sig.	R <sup>2</sup>	R	F	H0-1-1
0.009	0.360	0.600	7.181	Rejected

The application of the BSCs committed to merging other modern approaches such as the target costing, Kaizen approach, and activity-based costing to gain their benefits and operational efficiency in manufacturing companies. However, there were difficulties associated with such application in manufacturing companies, as follows: (i) managers could not weight equal importance of nonfinancial dimensions with financial dimensions, so they could not clearly understand the profit margin indicator with lower level of understanding of the customer satisfaction indicator (measured by the no. of valued clients), because of instability of most of nonfinancial dimensions goals; (ii) it is not easy for managers to merge the company's BSC with the individual's BSC, especially, on how to direct behaviours of individuals towards the company's strategy and its objectives in one mutual strategy, so there is a need to train individuals to learn how to match between them; (iii) some top managers perceived social costs as unimportant compared with achieving profitability of the company; (iv) unclear strategy of the company and incomplete information may lead to dysfunctional behaviours of managers and individuals resulting in unapplicable modern performance evaluation measures in manufacturing companies.

Accordingly, table (5) showed the regression results of the sub-main hypothesis, thus the H0-1-1 is rejected in that there is a significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on operational cost reduction in manufacturing companies in Syria ( $F = 7.181$  and  $\text{sig} = 0.009$ ). This result is in line with the prior study (MdZin, et.al., 2013).

H0-1-2 there is no significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on informal operational reports in manufacturing companies in Syria, as referred to in Table (6).

Table (6)  
 Regression results on applying BSCs on informal operational reports

Sig.	R <sup>2</sup>	R	F	H0-1-2
.064	0.373	0.611	3.691	Accepted

Having known the advantages and disadvantages of the six dimensions of BSCs, informal operational reports were not adopted by top management leading to less effects of the application of BSCs on these informal reports in manufacturing companies. However, the situation with those in the middle level of management is complete some formal operational reports by some contents of informal operational reports. Discussion with participants of the study on a such obstacle referred to continuous expanding of the content of formal operational



reports, with items on day-to-day operations, and get top management approval and, thus, sub-goals within the BSCs were modified.

Accordingly, table (6) showed the regression results of the sub-main hypothesis, where H0-1-2 is accepted in that there is a no significant impact ( $\alpha \leq 0.05$ ) of applying balanced scorecards (consisted of six dimensions) on informal operational reports in manufacturing companies in Syria ( $F = 3.691$  and  $\text{sig} = 0.009$ ).

H0-2 there are no differences of the impact of applying balanced scorecards-BSCs- (consisted of six dimensions) on increasing operational efficiency (operational cost reduction and informal operational reports) in manufacturing companies in Syria attributed to the academic and professional experience factor, as referred to in Table (7).

Table (7)  
 ONE WAY ANOVA results on the impact of BSCs  
 on operational efficiency attributed to the experience factor

Model		Sum of Squares	df	Mean Square	F	Sig.
H01-1, H01-2	Regression	131.705	3	43.902	8.230	.000 <sup>a</sup>
Attrib. to	Residual	330.734	62	5.334		
Experience	Total	462.439	65			

a. Predictors: (Constant), H01-1, H01-2

As we discussed earlier the individuals qualifications and experience factor is so important to success the applications of both the company's BSC and the individual's BSCs in manufacturing companies. Further, developing performance evaluation indicators within the framework of the BSCs can be achieved through experienced individuals who are able to understand the strategy and vision of the company and able to translating its predetermined objectives into actual profits (the financial dimension of the BSC); periodic production reports (the internal process dimension); clients satisfaction (the customer dimension); periodic employees training programs (the learning and growth dimension); employment opportunities and living welfare (the social dimension); and unsystematic/diversifiable risks and uncertainty (the risk dimension).

Results of the one-way ANOVA test, shown in table (7), rejected HO-2 in that there were differences of the impact of applying BSCs (consisted of six dimensions) on increasing operational efficiency (operational cost reduction and informal operational reports) in manufacturing companies in Syria attributed to the academic and professional experience factor ( $F = 8.232$  and  $\text{sig} = 0.000$ ). This is in line with prior studies, (Salterio, 2012).

## 8. Conclusions and Recommendations

### 8.1 Conclusions

Based on the research results, the following are a number of conclusions that reflected the positive impact of the BSCs in manufacturing companies in Syria:

1. based on the descriptive statistical analysis participants perceived the application of BSCs as between moderate to high levels (average results were between 2.33-5) with the conclusion that employees and managers of manufacturing companies perceived the importance of BSCs to translate the company's strategy and achieve predetermined objectives.
3. based upon inferential statistical results –HO-1- there was there was a significant impact of applying BSCs (consisted of six dimensions) on increasing operational efficiency (OE) (operational cost reduction and informal reports) in manufacturing companies in Syria. The conclusion is characterized by the need to apply BSCs to get their benefits not only in applying the integrated six dimensions but also to support control and auditing systems in manufacturing companies.
4. the regression results also showed –HO-1-1- that there was a significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on operational cost reduction in manufacturing companies in Syria. The conclusion is that the efficiency and effectiveness are important elements in companies and can be improved by the application of the BSCs for the company and for its individuals.
5. the regression results showed –HO-1-2- that there was no significant impact ( $\alpha \leq 0.05$ ) of applying BSCs (consisted of six dimensions) on informal operational reports in manufacturing companies in Syria. The conclusion is that informal reports and practices were perceived differently by middle and top management and not evaluated as such by formal procedures, so smart managers today deal with informal practices for the benefits of formal practice and therefore expanding the database of formal procedures within the BSCs framework.
6. results showed that there were differences –HO-2- of the impact of applying balanced scorecards-BSCs- (consisted of six dimensions) on increasing operational efficiency (operational cost reduction and informal operational reports) in manufacturing companies in Syria attributed to the academic and professional experience factor. The conclusion is characterized in focusing on intensive employees training programs and professional experience as a need to the application of the BSCs in manufacturing companies.

## 8.2. Recommendations

The following are research recommendations for manufacturing companies in Syria:

1. more studies are needed on the application of the company's BSC and the individual's BSC on other different manufacturing companies and banks with impacts on profitability, cash flows, and liquidity using different research methods: such as questionnaire forms and the content analysis.
2. adopting regular and continual training programs for different managerial levels in manufacturing companies to understand the application of the BSCs in these companies.
3. the need to discover new cases to identify areas of cost reduction for manufacturing companies to enhance performance effectiveness and efficiency of activities based on the application of BSCs, as done in this search.

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