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Impact of Balanced Scorecard on Value Chain and Financial Performance in the Jordanian Industrial Companies

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Abstract: This study aims to investigate the effect of the balanced scorecard, as a performance management tool that embeds technology, on different value chain stages and its impact on the performance of the industrial Jordanian firms. The study sample consists of 300 industrial employees from firms listed in Amman Stock Exchange (ASE) with a response rate of 88%. The study developed an empirical questionnaire to collect the main data related to the perceptions of the employees regarding the balance scorecard (BSC), as well as the value chain stages. The study reveals a positive impact of the implementation of the BSC on the development of the value chain stages. It also reveals that BSC positively impacts the financial performance of the listed industrial Jordanian firms. The finding could be helpful to industrial firms adopting BSC and to the managers as well, by enhancing their satisfaction and by aligning firms results with those pre-established goals through the balanced scorecard and its sequences on the value chain stages and financial performances.

Keywords: ASE; Balanced Scorecard; Financial Performance; Jordanian Industrial Companies; Value Chain Stages.

1 Introduction

The rabid changes of the business environment add more pressures on economic units within the manufacturing environment [1]. These changes necessitate companies to constantly search for efficient and appropriate sources and methods that will support and gain a competitive advantage, as an important factor of success in markets [2]. Firms should also identify and measure critical technologies to ensure continued market leadership.

Organization managers need important and appropriate information that enables them to manage their organizations considering these ongoing changes [3]. The management accounting system should be able to provide the correct information to enhance the value of the economic unit, to support the implementation of strategic goals, to improve the cost management process and techniques, and to help the economic unit to develop a competitive advantage [4]. To this end, the traditional methods of measuring firms' performance became unable to capture the new environment that is characterized by turbulence and rapid change, even though, this environment became an obstacle to the organization's ability to create economic value in the long run [5].

Further, the review of literature indicated that there is a need for a comprehensive information security governance framework, to meet the objectives of the organization. The changes in business and organization requirements require a dynamic and adaptable framework, which requires the top management support [6]. In this regard, the greatest attention was directed towards searching for an appropriate, effective, and comprehensive method that transcends the limits of the organization to go beyond traditional indicators, to include the performance of competitors and customer requirements [7].

Information technology plays a significant role in strategic planning, as the strategic plans should utilize the advancement in information technology which plays a significant role in carrying out the different activities of the value chain [8]. Balanced scorecard (BSC) is considered the best method to capture and consider the balance between financial and non-financial results, the balance between the short term and the long-term measures, and the balance between tactics and strategy. In 1996 specifically, Kaplan and Norton presented the balanced scorecard with four perspectives: the financial prospective, the customer prospective, the internal operations perspective, and the learning and growth perspective [9].

The value chain is a useful tool for identifying, managing, and costing competitive advantages. Thus, companies should

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pay attention to their managerial and financial management practices that help in identifying and maintaining their competitive advantages, or in some cases, must develop such advantages. This warrants the use of models and techniques, such as the value chain [10]. As the balanced scorecard is closely related to the business functions and the value chain activities, it provides the managers with useful information needed to perform their job efficiently and effectively [11]. The non-financial perspectives of the balanced scorecard include measurements relating to the activities of the value chain [12], and if the balanced scorecard perspectives are efficiently linked to the value chain activities, this will reflect positively on the financial perspective [13]. Relating the value chain activities (main and support) to the BSC perspectives normally leads to an efficient allocation of resources, by guiding the activities of the value chain [14].

The barriers to use the blockchain technology-based platforms and its relationship with the balanced scorecard are studied and prioritized by some research papers conducted in different sectors, however there is a need to explore the impact of the balanced scorecard on the value chain and the performance of the firms in the current era, given the advancement in value chain activities [15].

This research adds significant contributions to literature on value chain and balanced scorecard in several ways. First, it reviews studies related to three vital items for the institution's success: the BSc, value chain and financial performance. It also offers empirical insights into the relationship between these three items. It also indicates the necessity to address the obstacles faced by the Jordanian firms in implementing the Balanced Scorecard. Further, the research provides suggestions for future studies.

2. Materials and Method

The developments occurred after the industrial revolution, the increase in competition intensity, and the emergence of the technological revolution in the fields of production and information systems, led to complexity in the operations of the institutions [16]. The institution needs to serve and retain the customer. It also needs to pay attention to continuous improvement of quality and the provision of innovative products and rapid response to the desires of customers, with the aim of facing the challenges of cost reduction, which led to a tendency to search for new ways and methods that ensure the smooth running of its operations and enable it to evaluate its activities, and reveal the efficiency of its performance, not only financial, but all types of performance. A new approach called the "Balanced Score Card" appeared in an article by the authors Robert Kaplan and David Norton in Harvard Business Review in 1992 [17].

2.1 Definition of the Balanced Scorecard

Kaplan and Norton define the Balanced Scorecard (BSC) as: "a management style that translates the organization's vision and strategy into a set of measures that cover the overall performance of the organization and provide a framework for measuring and managing strategy through four dimensions: the financial dimension, the customer dimension, the internal operations dimension, and the learning and growing dimension" [18].

Simona. A. defined it as: "A framework for performance management that links the organization's strategy to daily operations and provides a comprehensive view of the project, as it consists of a set of performance measures that cover a comprehensive vision of the organization based on four perspectives: the financial perspective, the customers' perspective, the internal operations perspective, and the learning and growth perspective." [19].

2.2 Value Chain

Based on the value chain definition provided by Porter [20], Day [21], and Ansari [22], the value chain is seen as a method, or an analysis that requires a study of all the internal and external activities of the organization, so those activities are arranged and organized according to an organizational structure and the selection of efficient human resources who are capable to achieve the optima use of those resources, in a manner that helps achieving the best return for the organization.

Value chain analysis helps the organization reduce the operations costs and identify opportunities to develop the organization's business. It also helps identify performance indicators for the management information systems in the organization [23]. The activities of the value chain have been of interest to many scholars [24], [25], and [26]. According to their findings, they classified these activities to input activities that associate with handling the raw materials and inspection, the production processes that is related to managing the materials needed and used for production, output activities which include distribution where organizations rely on intermediaries to sell their products to consumers, marketing and selling where the firms needs to identify and understand the needs of consumers or discover new marketing opportunities, and service activities that represented by after-sales services such as maintenance operations and delivery of the commodity to the customer. Furthermore, several studies have covered the supporting activities of the value chain and have highlighted their importance [27], [28], and [29].

2.3 Financial Performance

For financial performance, researchers are still discussing performance as a technical term [30]. Financial performance is an integrated system that compares actual results from selected indicators with those that reflect performance results during previous periods or performance results in economic units, considering historical and structural conditions and considering the convergence of sizes for these units [31]. On the other hand, financial performance is defined as "a measure of the achieved or expected results in light of pre-determined criteria and a judgment on the management of the natural resources available to the institution, and this is to serve different parties related to the institution." [32].

In the same line, a study conducted by Areiqat *et al*. [33] reveals a significant impact of the four perspectives of the BSC on the financial performance of the industrial companies. Mseden & Nassar study [34] investigated the effect of implementing the balanced scorecard on the financial performance of the industrial companies in Jordan. The results of the study indicated that the internal process, innovation and growth, and customer as BSC perspectives have a significant positive effect on the ROA and ROE, as measurements of the financial performance. Similarly, [35] result showed that small and medium sized firms benefited from the application of the BSC for feedforward control. The firms used BSC resulted in higher financial performance and higher exploitative innovation outcomes.

2.4 The Relationship Between the Balanced Scorecard and the Value Chain Activities

The value chain is analyzed by [36], [23], and [37], to assess the methods and improvements used by the organizations to provide services and products to their customers. Further, value chain is analyzed to ensure that the resources of each unit of the firm are managed consistently to improve the resources utilization [38]. The design, production, marketing, and support of the services and products, include a set of activities, which are presented using the value chain, thus the value chain reflects the performance of these activities carried out in the organization, therefore the value chain reflects the performance of the organization.

A study by Porter [39] has indicated that the organization's value chain differs among the companies based on the differences in the elements of production lines, customers characteristics, geographical areas, or distribution channels. Directing the value chain activities by linking them to the BSC is considered a vital tool for managing the organization [38]. The level of the firm's performance can be improved by integrating financial and non-financial indicators into the performance measurements techniques [40].

2.5 Research Hypotheses

H_1: The implementation of the Balanced Scorecard has a positive impact on the development of the value chain.

H_2: The Balanced Scorecard has a positive impact on the financial performance of Jordanian industrial companies.

2.6 Research Methodology

2.6.1 Variables of study

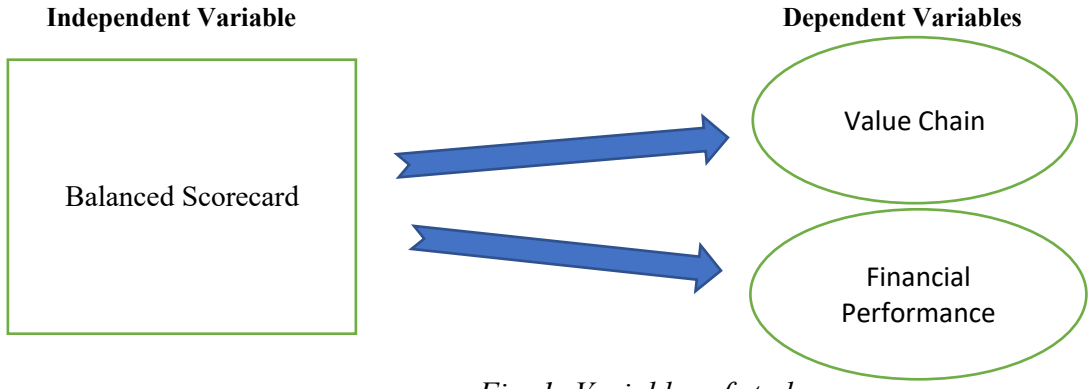

Fig. 1: Variables of study

2.6.2 Study Population and Sample

The study sample is randomly selected. It consists of three hundred employees. The study adopted a questionnaire to collect data. The questionnaire was distributed electronically to the study sample members, where (276) questionnaires were retrieved, and (12) invalid questionnaires were excluded for the purposes of statistical analysis, so that the researcher had (264) with a percentage (88%) of the study sample.

2.7 Study Instrument

The study used a questionnaire as a data collection tool, which includes two parts as following:

The first part contains demographic factors. The second part includes both independent variables (balanced scorecard) measured through (12) items, and dependent variables (value chain) and (financial performance), which were measured through (10) items each.

Table 1: The five-point Likert scale scores used in the study tool

Scale Degree	**Degree Of Approval**	**Relative Weight**
Strongly Agree	5	81% - 100%
Agree	4	61% - 80%
Medium	3	41% - 60%
Disagree	2	21% - 40%
Strongly Disagree	1	0% - 20%

The statistical criterion was used to assess the importance of the study items (Paragraphs), by categorizing the results into three levels (high, medium, and low), using the equation below:

Category Length = (Maximum Alternative - Minimum Alternative) / Number of Levels

Category length = (1-5)/3 = 4/3 = 1.33 and so levels are estimated as follow:

Table 2: Relative importance and the corresponding arithmetic mean

Level of relative importance	**Law**	**Medium**	**High**
Computational Medium	**1 – 1.33**	**2.34 – 3.66**	**3.67 – 5.00**

2.8 Construct Validity Test (Factor Analysis):

The construct validity and the data explanatory and conformity were assessed using the Principal Component Factor Analysis with Kaiser Meyer Olkin (KMO). If the factor is loading more than 0.50, it is considered good. It is considered accepted if it exceeds 0.40 [41]. The analysis indicates that the load factors are 0.444 to 0.732, 0.500 to 0.708, and 0.550 to 0.678 for the balanced scorecard elements, value chain elements, and financial performance elements respectively, therefore, the correctness of the construction is assumed. While the reliability test, Cronbach's Alpha, indicates that reliability has been considered since study variables ranges from is greater than 70%, it was range from 0.922 to 0.937.

3. Data Analysis

3.1 Demographic Respondents Characteristics

Table (3) displays that most of the respondents, (110) participants, are bachelor's degree indicating 41.7%, while the lowest number is for PhD holders (34) participants with a percentage of 12.9 %. For the job title, most of the respondents have an "administrative employee" job title. The lowest percentage of the job titles was "other" and their number was (2) participants at a rate of (0.8%).

Table 3: Demographic Characteristics of Respondents

Educational Qualification			Job Title			Years of Experience		
	Frequency	Percent		Frequency	Percent		Frequency	Percent
Intermediate Diploma	50	18.9	Manager	60	22.7	Less Than 5 Years	48	18.2
Bachelor's	110	41.7	Department Head	76	28.8	From 5 to 10 years	58	22.0
Master	70	26.5	Accountant	20	7.6	From 11 to 15 years	46	17.4
PhD	34	12.9	Administrative Employee	106	40.2	More than 15 years	112	42.4
Total	264	100.0	Other	2	0.8	Total	264	100.0
			Total	264	100.0			

Most of the respondents have "more than 15 years" experience with (112) participants, representing (42.4%), and the lowest percentage of those with experience was "From 11 to 15 years", and their number was (46) participants,

representing (17.4%).

3.2 Descriptive Statistical Analysis

The descriptive analysis of this study used the mean, the standard deviation, the ranking, and the importance, to further analyze the perceptions of the responses. It also considers the degree of each sub-variable importance for the items and dimensions.

The following formula is used to calculate the importance of each item: 5-1/3= 1.33, as a result, the importance of the item is divided into three levels as follows:

From 3.67 to 5.00 is high importance, from 2.34 to 3.66 is medium importance, and from 1.00 to 2.33 is low importance.

- **Independent Variable (Balanced Scorecard)**

Table No. (4) shows the arithmetic averages and standard deviations of the items of the balanced scorecard, it also shows the relative importance of each item of the balanced scorecard, as follows:

Table 4: Mean, SD, Order, and Importance of BSC items:

No.		M	S. D	T	Rank	Lmp.
1	The institution in which I work sets out its objectives precisely.	3.96	0.831	2.450	1	High
2	The Foundation seeks to improve its financial position.	3.86	0.762	3.128	3	High
3	The organization's management is efficient in using its financial resources.	3.74	0.746	2.850	6	High
4	The organization's financial returns increase annually.	3.45	1.004	3.183	11	Medium
5	The financial returns earned by the organization apply with the planned.	3.62	0.998	2.473	8	Medium
6	The organization reduces the costs of its production operations to increase market value.	3.92	0.920	3.932	2	High
7	The organization seeks to keep up with customers' needs as quickly as possible.	3.86	0.825	3.674	4	High
8	The enterprise improves its products to increase its market share.	3.79	0.931	2.691	5	High
9	The Foundation seeks to possess sophisticated technological means to help do business more accurately.	3.36	1.056	3.120	12	Medium
10	The Foundation motivates its employees to introduce new ideas and technologies	3.73	0.835	2.617	7	High
11	Incentive and reward systems distinguish competencies among employees of the organization.	3.51	0.943	2.096	9	Medium
12	The training programmes implemented by the Foundation are aimed at building new skills among employees	3.48	0.927	2.785	10	Medium
	Total Balanced Scorecard	3.69	0.509	2.916		High

T-tabulated= 1.960

As shown in table (4), the average of the balanced scorecard dimension was 3.69, which indicates a high degree of agreement from the respondents' point of view. By looking at the results, it was clear that the paragraph "The institution in which I work sets out its objectives precisely." ranked first with a mean of (3.96) and a standard deviation of (0.831). However, Paragraph 9, which reads "The Foundation seeks to possess a sophisticated technological means to help do business more accurately." is ranked last with a mean of (3.36) and a standard deviation of (1.056). According to the overall results, the industrial companies in Jordan have a high degree of use of the Balanced Scorecard. This is supported by a high t-value of (2.916) compared to the T-table of (1.960).

- **The First Dependent Variable (Value Chain)**

Table No. (5) shows the arithmetic averages and standard deviations of the items of the Value Chain, and it shows the relative importance of each item of the Value Chain, as follows:

Table 5: Mean, SD, Order, & importance of Value Chain items:

No.		M	S. D	T	Rank	Lmp.
1	The Foundation is concerned with classifying activities according to their relationship with value added.	3.73	0.783	4.554	7	High

2	The organization determines the importance of each productive activity.	3.64	0.917	3.872	10	Medium
3	Receiving raw materials is one of the organization's main activities.	3.77	0.746	3.710	5	High
4	The organization is interested in the storage and distribution of raw materials as an independent activity.	3.70	0.922	3.874	8	High
5	Process activity is the necessary to convert raw materials into essential products.	3.68	0.812	6.278	9	High
6	Packaging, shipping and distribution are essential activities in the enterprise.	3.77	0.905	5.153	6	High
7	There is a special section that attracts new customers and keeps existing customers.	3.88	0.855	4.356	1	High
8	Sales orders can be received electronically to facilitate customers	3.85	0.935	5.124	2	High
9	The enterprise is interested in after-sales services offered to customers.	3.78	0.861	4.689	4	High
10	There is an electronic link between the internal and external processes of the core activities of the organization	3.84	1.001	6.720	3	High
	Total Value Chain	3.76	0.516	4.833		High

T-tabulated= 1.960

As shown in Table (5), the average of the dimension (Value Chain) was 3.76, which indicates a high degree of agreement from the respondents' point of view. By looking at the results, it was clear that Paragraph 7 "There is a special section that attracts new customers and keeps existing customers." ranked first with a mean of (3.88) and a standard deviation of (0.855). However, Paragraph 2, which reads, "The organization determines the importance of each productive activity" is ranked last with a mean of (3.64) and a standard deviation of (0.917). According to the overall results, the industrial companies in Jordan have a high degree of use of the Value Chain. This result is supported by the t-value (4.833) compared to the t-tabulated (1.960).

- **The Second Dependent Variable (Financial Performance)**

Table No. (6) shows the arithmetic averages and standard deviations of the financial performance items. It also shows the relative importance of each item of the Financial Performance, as follows:

Table 6: Mean, SD, Order, & Importance of Financial Performance Items

No.		M	S. D	T	Rank	Lmp.
1	The Foundation works to provide information related to financial performance.	3.58	0.915	3.475	8	High
2	The Foundation's future endeavours to expand its activities	3.86	0.913	3.688	2	High
3	The Foundation seeks to develop strategic plans to improve financial performance.	3.66	0.993	3.645	4	High
4	The Foundation has been making increased profits since the start of the activity to date.	3.87	0.727	2.640	1	Medium
5	The Foundation's results are satisfactory to management and match pre-established objectives.	3.60	0.905	5.360	6	Medium
6	The work performed in the organization is measured periodically.	3.58	0.818	4.365	7	High
7	The Foundation's planning, control and decision-making are based on scientific characteristics.	3.66	0.954	4.612	3	High
8	The institution is provided with the necessary information by employees and accountants.	3.54	1.057	4.691	9	High
9	The organization identifies strengths, weaknesses, corrects errors and reinforces strengths.	3.36	0.933	5.945	10	Medium
10	The Foundation solves financial problems quickly and innovatively.	3.64	0.892	3.645	5	High
	Total Financial Performance	3.63	0.511	4.206		High

T-tabulated= 1.960

As shown in Table (6), the average dimension (Financial Performance) was 3.63, which indicates a medium degree of agreement from the respondents' point of view. By looking at the results, it was clear that Paragraph 4 "The Foundation has been making increased profits since the start of the activity to date" ranked first with a mean of (3.87) and a standard deviation of (0.727). However, Paragraph 9, which reads, "The organization identifies strengths, weaknesses,

corrects errors and reinforces strength." Is ranked last with a mean of (3.36) and a standard deviation of (0.933). According to the overall results, the industrial companies in Jordan have a medium degree of use of the Financial Performance. This result is supported by a high t-value of (4.206) compared to the t-tabulated (1.960).

3.3 Testing Study Hypotheses

The researchers performed a group of tests, such as normality tests and multicollinearity tests, before implementing regression analysis tests [42] as follows. The skewness and Kurtosis of the study variables in Table (7) ranges between -2 and 2, indicating that they are normally distributed [43], and [44].

Table 7: Results of the normality of the distribution

Variables	Skewness	Kurtosis
Balanced Scorecard	0.181	0.014
value chain	0.254	-0.145
financial performance	0.434	0.072

Using the results of Variance Inflation Factor (VIF) and the Tolerance Variant Statistics, independent variables dimensions indicate no multicollinearity. In table (8) the tolerance coefficient was lower than (1), higher than (0.05), and all three values of VIF were less than (10). Based on a study conducted by Hair et al. [41], these values suggest that there is no multi-collinearity among all dimensions, demonstrating that multiple regression analysis can be used to test study hypotheses.

Table 8: Results of testing the strength of multi-collinearity between variables.

Variable	Collinearity Statistics	
	Tolerance	VIF
Balanced Scorecard	0.475	2.107
value chain	0.574	1.743
financial performance	0.516	1.937

Multiple regression is run to test the hypothesis. Based on the significance level (α), the null hypothesis (H0) is accepted or rejected. The significance level (α) was adopted as (0.05) as the maximum. Therefore, if the level of significance is less than or equal to (0.05), then a statistically significant impact will be felt, but if the level is higher than (0.05), no statistically significant impact will be felt.

- **The First Main Hypothesis**

As stated in table (9), the R-value of the first dimension (0.696) indicates a positive correlation between the BSC and the value chain. Based on the R2 = 484, it can be concluded that Balanced Scorecard domain explained (48.4%) of the value chain, when all other variables remain constant. Based on the analysis above, the first main null hypothesis is accepted indicating that: The implementation of Balanced Scorecard has a positive impact on the development of the value chain.

Table 9: Impact test results H1

D.V	Model Summery		ANOVA		Coefficients			
	R	R2	F	Sig F*	B	standard error	T	Sig T*
value chain.	0.696	0.484	245.530	0.000	0.687	0.044	15.669	0.000

*The effect is statistically significant at the level ($\alpha \leq 0.05$)

- **The Second Main Hypothesis**

With reference to regression results summarized in table (10), the R-value of the first dimension (0.653) indicates a positive correlation between the Balanced Scorecard and the financial performance. Based on the R2 = 426, it can be concluded that Balanced Scorecard domain explained (42.6%) of the financial performance, when all other variables remain constant. Based on the above analysis, the second main null hypothesis is accepted indicating that the Balanced Scorecard has a positive impact on financial performance of companies.

Table 10: Impact test results H2

D. V	Model Summary		ANOVA		Coefficients			
	R	R2	F	Sig F *	B	Standard Error	T	Sig T *
financial performance	0.653	0.426	194.579	0.000	0.650	0.047	13.949	0.000

*The effect is statistically significant at the level ($\alpha \leq 0.05$)

4. Conclusion and Recommendations

The results of the study confirmed the effect of implementing BSC on the value chain as well as on financial performance in the Jordanian Industrial Companies. The findings of this study confirmed the results of previous studies, which acknowledged the effect of implementing BSC perspectives in the industrial companies on developing the value chain [45], [46];[47], and [48].

The implementation of the Balanced Scorecard has a positive impact on the development of the value chain and on the financial performance of the firms. Whereas the balanced scorecard is one of the modern trends and techniques in managerial accounting that are used for the purpose of evaluating the performance of economic units, which include an integrated and interconnected set of financial and non-financial indicators, and for the purpose of verifying the effectiveness of these units in achieving their objectives and the way they were carried out. This result matches with [49], [50], [51], [52], [53], [54] results, which indicated that information technology governance and technology advancement helps companies to plan and manage their investments in IT and to achieve their objectives. The result of this study is also consistent with several previous studies [33], [34], [35]. The balanced scorecard is a tool for strategic management, as it ensures the planning of a strategy that ends with the achievement of the specified goals and objectives, considering continuous control and accountability. This strategy becomes the focus of every employee's attention, and thus this system can be taken as a tool for translating strategies into actions.

Based on the results, the study recommends the following:

- To improve the financial performance, the Jordanian industrial companies need to set pre-established goals and link them to the balanced scorecard, reflecting the value chain activities.
- The necessity for Jordanian industrial companies to address the obstacles that stand in the way of implementing their Balanced Scorecard. As there is a weakness in companies identifying strengths and weaknesses, correcting errors, and enhancing strengths.
- Holding courses and developing specialized training programs for the company's employees to train them on how to design and operate the Balanced Scorecard model and to make them aware of the benefits that the company derives from using this model.

It is suggested that, in future research, a comparison study can be carried out, comparing the impact of the BSc on the value chain and the performance in different sectors, to assess the significance of the impact among different sectors.

Conflicts of Interest Statement

The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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