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The impact of a trend pattern for sustainable marketing budgets on turnover dynamics (a case study)

Alexandru Capatina¹, Adrian Micu¹, Nicoleta Cristache¹, Angela Eliza Micu²

ABSTRACT

In business practice, sustainable marketing seeks to meet environmental and social sustainability needs. Sustainable marketing budgets should create a balance between market needs and the need to use existing resources as rationally as possible.

By recognizing that certain internal and external factors may cause fluctuations in sustainable marketing budgets and have a direct impact on the expected turnover, managers could capture opportunities to channel these budgets into business areas with higher return on investment (ROI).

This study highlights the trends of sustainable marketing budgets in the case of one company and assesses their impact on its business turnover. Based on the assumed objective, this study provides explanations regarding the efficiency of sustainable marketing budgets in terms of benefits and, more precisely, on turnover dynamics. From the methodological perspective, the use of the coefficient of variation method allows the assessment of the longitudinal data homogeneity, reflecting the dynamics of the indicators, sustainable marketing budgets and turnovers. The results reveal that monthly sustainable marketing budgets have a significant impact on monthly turnover dynamics, considering the quadratic trend in the case of monthly sustainable marketing budgets and the exponential trend of monthly turnovers. From a managerial perspective, the implications of this study reveal that the more you invest in sustainable marketing, the more revenue your company could earn.

KEY WORDS: sustainable marketing, sustainable development, trend pattern, coefficient of variation

JEL Classification: M31, M21, O21, O32

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1. Introduction

Major concerns at national and international forums have increased due to exponential population growth, the dynamics of industry, excessive consumerism and numerous ecological disasters. The expectations of

civil society regarding the impact of economic activity on sustainable development are higher.

The concept of sustainable development belongs to the new theory of economic development. From this perspective, an explanation, even an exhaustive one, is required, given the abundant use of this theory for sustainable development.

In business practice, the use of sustainability assessment methodology occurs when relevant decision makers measure environmental and social issues

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using an evaluation scale and integrate all aspects of the business processes to enable an overview of the rated domain (Lee & Grewall, 2004).

The conceptualization of sustainable marketing orientation has been focused on the micromanagement of ecological issues. Key performance indicators related to corporate sustainability have only been developed in the past decade (Mitchell, Wooliscroft, & Higham, 2010).

Sustainable marketing has pushed companies towards new forms of 'green consumerism', which reinforce awareness of environmental standards and inform companies about the benefits of a 'green' image (Redclift, 2005).

The research question addresses the following topic: How do sustainable marketing budgets adopted by a company that is characterized by a sustainable market orientation influence its turnover dynamics?

The primary objective of this study is the identification of trend patterns related to the dynamics of sustainable marketing budgets, as well as their effects on the dynamics of business turnovers, in the case of a Romanian company in the retailing industry.

This study contributes to extant literature for two reasons: first, we present evidence on the statistical relations between trends of monthly sustainable marketing budgets and monthly turnovers. Our results extend the understanding of the role played by sustainable marketing budgets on the increase of revenues. Second, our empirical results indicate that the type of trend (linear, quadratic or exponential) related to the variables (monthly sustainable marketing budgets and respective monthly turnovers) have substantial higher explanatory power than other metrics.

This paper is organized as follows: First, we provide a theoretical background on sustainable marketing and highlight the most relevant research outcomes in this field. Then, the framework for a qualitative research, based on coefficient of variation method, is developed. Finally, the trend patterns for both sustainable marketing budgets and turnovers are discussed, illustrating how the proposed methodological framework can bring valuable contributions to the body of knowledge related to sustainable marketing.

2. Theoretical background

The core of sustainable marketing reveals the decisions in which environmental issues are emphasized and environmental strengths are used as a competitive advantage (Karna, Hansen, & Juslin, 2003). The concept of sustainable marketing is extended towards fulfilling the needs of future generations, which implies creating, communicating and delivering sustainability-based value to the next generations (Kumar, Rahman, Kazmi, & Goyal, 2012).

The difference between corporate social responsibility (CSR) and the strategically based marketing view of sustainability must be emphasized, considering that market-focused sustainability can be a strategic resource that leads to competitive advantages (Hult, 2011). The primary challenge given by this context is to integrate aspects related to environmental and social issues into marketing processes (Figge & Hahn, 2004; Pautard, 2004). According to specialists, a detailed guidance on the relative weighting given to indicators of sustainable marketing (Baker, 2007) is part of a series of priorities for business and is meant to offer insights into decision-making processes in the marketing policies of companies.

Marketing efforts regarding sustainable development include a better quality of life at the present and for future generations (Purcarea, 2008). The need for sustainable development monitoring systems for the effective governance of marketing activities has no headline indicator (Urbaniec, 2016) because no indicator is considered strong enough and important for policies to be able to provide a broad overview of the assessment of sustainable marketing.

Therefore, it is assumed that in marketing, "sustainability is a value - it is a moral choice to accept equity between generations, regarded as superior ethics" (Capron, 2005). We observe the emphasis on the moral value terms, ethics and fairness. However, these terms do not provide consistency in debates regarding sustainable development.

More issues related to sustainable marketing are increasingly institutionalized (Bansal, 2002). The adoption of standardized management systems, such as the ISO 14,000 (Morrow & Rondinelli, 2002; Rondinelli & Vastag, 2000) and official guidelines and recommendations for environmental and social reports, such as the Global Reporting Initiative (2011),

are examples of best practices for the sustainable marketing policies of companies.

From the sustainable marketing perspective, for many people today, products just appear in a shop and there is little or no awareness of where they came from or how they were made – thus, many sustainability issues arise (Giddings, Hopwood, & O'Brien, 2002). Moreover, consumers who express a preference for sustainable marketing report that they are not always able to identify and/or apply information that could help them exercise this preference (Cairns & Macdonald, 2016). The sustainability dimension considers labeling of products or services an effective tool of marketing that a company can use to attempt to improve its competitive position. The societal pressures highly interact with market forces to shape this sustainability dimension (De Boer, 2003).

The creation of value, beyond the financial value embedded in profits, has changed the debate in managerial issues, which may include the socially responsible marketing practices of firms to reinforce their reputations or create real value for all stakeholders (Gallego-Alvarez, Prado-Lorenzo, Rodríguez-Domínguez, & García-Sánchez, 2010). The effects of large investments in sustainable marketing on financial metrics were noted by a major result of a study, which highlights that high sustainability firms outperform traditional firms when we consider accounting rates of return, such as turnover (Eccles, Ioannou, & Serafeim, 2014).

Marketing concepts should interface with the concept of sustainability to strive towards meeting global development requirements and balancing the business ecosystem (Nkamnebe, 2011). To determine the degree of corporate sustainability in terms of commitment to sustainable initiatives and the ability to communicate them through targeted marketing efforts, self-assessment tools for sustainable initiatives are frequently used by high sustainability firms (Baldassarre & Campo, 2016). Christofi, Leonidou and Vrontis (2014) propose an integrated framework for organizations to gain a sustainable competitive advantage by implementing sustainability through marketing, product innovation and leadership.

As a concluding remark regarding the body of knowledge dedicated to sustainable marketing, companies pursuing the sustainability dimension engage in

marketing activities related to managing environmental and social issues (Sun, Garrett, & Kim, 2016).

3. Research Methodology

To achieve the research goal mentioned in the introduction, we conducted a qualitative study aimed at determining the temporal evolution of sustainable marketing budgets' dynamics within the analyzed firm. We focused our attention on building a panel, represented by the sustainable marketing budgets, and apply repeated monthly measurements during two consecutive years: 2012 and 2013.

The conceptual architecture of trend patterns considers marketing budgets as investments, enabling the company selected for the current study to confront the temporal relationship between marketing actions and marketplace reactions, an approach consistent with Sheth and Sisodia (2002).

Given the confidentiality related to financial data, it was difficult to find a Romanian company from the retailing industry whose manager would agree to provide us with the required information for addressing the research question. We selected the company based on its manager's willingness to provide us financial reports regarding monthly sustainable marketing budgets and turnovers.

We were particularly interested in analyzing the trend patterns related to the correlations between sustainable marketing budgets and turnover to better understand the issues regarding the effective assignment of sustainable marketing budgets in a real-life context.

During the first preliminary meeting, the following three hypotheses were stated:

Null hypothesis - H_0 - the trend pattern for the monthly sustainable marketing budgets and monthly turnovers of the company from the retailing industry is a **linear function**.

First alternative hypothesis - H_1 - the trend pattern for the monthly sustainable marketing budgets and monthly turnovers of the company from the retailing industry is a **quadratic function**.

Second alternative hypothesis - H_2 - the trend pattern for the monthly sustainable marketing budgets and monthly turnovers of the company from the retailing industry is an **exponential function**.

The testing of the three above stated hypotheses, which represents the foundation for explaining the

conceptual model of the longitudinal research, included the use of the variation coefficient method, through which we can evaluate the selection criteria for the optimal trend model.

When good time-series data on revenues and marketing budgets are available, it is possible to apply multivariate measures to identify which strategic scenarios could occur and which trend patterns could be observed (Dekimpe & Hanssens, 1999).

Using trend patterns to test the usage frequency of online cyclical payments compared to other payment channels (Szopinski & Staniewski, 2014) is a good practice for developing the architecture of the current research framework.

The variation coefficient method is among the most applied statistical instruments aimed at valuing the consequences generated by group differences at an organizational level. This method is focused on comparing the internal variations of the research variables (Bedeian & Mossholder, 2000). Even if the variation coefficient is also used to determine data or samples' distributions, in the context of trend model's identification, it is generally viewed as an analytic and measurement instrument for sampled data.

The variation coefficient represents the index of the standard deviation of the average, and makes a comparison of the sample comparison, although the averages differ significantly. In our case, the sustainable marketing budgets were allocated by the company's manager in alignment with specific priorities. The primary rule of the variation coefficient method states the following: the lower value of the variation coefficient, the greater the homogenization of the data.

4. Analysis and Findings

A preliminary data analysis shows that the company assigned higher **sustainable marketing budgets** for the period of June-August and December of each year and generally, the turnovers were directly influenced by the amounts invested in sustainable development campaigns.

The monthly sustainable marketing budgets and monthly turnovers of the company analyzed in our study were synthesized from the financial reports provided by the company's manager and are provided in Table 1.

Targeting allows an enterprise to channel its sustainable development budget where there is the great-

est (and fastest) possibility of return on investment (ROI). In this manner, our study provides explanations regarding the efficiency of budget assignment in terms of benefits perceived as turnover.

4.1 Analysis of the trend pattern related to monthly sustainable marketing budgets' dynamics

Using the data in Table 1, first, we presented the statistical pattern reflecting the trend of the monthly sustainable marketing budgets assigned by the analyzed company for the period 2012-2013. In this manner, we applied the coefficient of variation method as the selection criterion for the optimal trend pattern.

In the conditions of null hypothesis H_0 , which proposes that the trend pattern for the X factor (the monthly sustainable marketing budgets, influencing the turnover of the company) is a **linear function** $x_i = a + b \cdot t_i$, the parameters "a" and "b" will be calculated using the following system of equations:

$$\begin{cases} n \cdot a = \sum_{i=-m}^m x_i \\ b \cdot \sum_{i=-m}^m t_i^2 = \sum_{i=-m}^m t_i \cdot x_i \end{cases} \quad (1)$$

Consequently,

$$a = \frac{\sum_{i=-m}^m x_i}{n} \quad (2) \quad \text{and} \quad b = \frac{\sum_{i=-m}^m t_i \cdot x_i}{\sum_{i=-m}^m t_i^2} \quad (3)$$

Using the statistical data that have been calculated to fit the linear function (Table 2), we are able to determine the following values for the parameters "a" and "b" using an Excel spreadsheet as follows:

$$a = \frac{330.044}{24} = 13.751,83 \quad \text{and} \quad b = \frac{169.622}{1.300} = 130,48$$

Thus, the coefficient of variation in the case of the linear function will be:

$$v_i = \left[\frac{\sum_{i=-m}^m |x_i - x'_i|}{n} : \frac{\sum_{i=-m}^m x_i}{n} \right] \cdot 100 \Rightarrow v_i = \frac{\sum_{i=-m}^m |x_i - x'_i|}{\sum_{i=-m}^m x_i} \cdot 100 \quad (4)$$

$$v_i = \frac{59.770,36}{330.044} \cdot 100 \Rightarrow v_i = 18,11\%$$

Table 1. The evolution of the monthly sustainable marketing budgets and turnovers of the company, in the period 2012 - 2013

Year	Month	Average monthly sustainable marketing budgets (EURO)	Average monthly turnovers (EURO)
2012	January	11.470	78.322
	February	9.320	71.160
	March	12.850	86.468
	April	10.145	82.234
	May	14.140	107.236
	June	17.134	125.260
	July	18.460	114.207
	August	15.360	129.459
	September	12.640	104.460
	October	12.115	94.720
	November	11.430	96.236
	December	19.450	142.364
2013	January	10.840	88.260
	February	8.800	73.124
	March	10.390	78.360
	April	12.230	87.320
	May	13.200	96.240
	June	14.360	102.450
	July	16.940	123.236
	August	16.320	135.172
	September	13.210	115.576
	October	12.360	102.360
	November	15.460	106.361
	December	21.420	156.367

Source: Adapted from "Financial reports" [Internal data] by Grande Gloria (2014, November 20). Available at <http://www.grandegloria.com/en/>

Table 2. The pattern reflecting a linear function for the analysis of sustainable marketing budgets dynamics in the case of company

Year	Month	Monthly sustainable marketing budget (EURO) (xi)	Linear trend				
			t_i	t_i^2	$t_i x_i$	$x_i = a + bt_i$	$ x_i - x_t $
2012	January	11.470	-12	144	-137.640	12.186,07	716,07
	February	9.320	-11	121	-102.520	12.316,55	2.996,55
	March	12.850	-10	100	-128.500	12.447,03	402,97
	April	10.145	-9	81	-91.305	12.577,51	2.432,51
	May	14.140	-8	64	-113.120	12.707,99	1.432,01
	June	17.134	-7	49	-119.938	12.838,47	4.295,53
	July	18.460	-6	36	-110.760	12.968,95	5.491,05
	August	15.360	-5	25	-76.800	13.099,43	2.260,57
	September	12.640	-4	16	-50.560	13.229,91	589,91
	October	12.115	-3	9	-36.345	13.360,39	1.245,39
	November	11.430	-2	4	-22.860	13.490,87	2.060,87
	December	19.450	-1	1	-19.450	13.621,35	5.828,65
2013	January	10.840	1	1	10.840	13.882,31	3.042,31
	February	8.800	2	4	17.600	14.012,79	5.212,79
	March	10.390	3	9	31.170	14.143,27	3.753,27
	April	12.230	4	16	48.920	14.273,75	2.043,75
	May	13.200	5	25	66.000	14.404,23	1.204,23
	June	14.360	6	36	86.160	14.534,71	174,71
	July	16.940	7	49	118.580	14.665,19	2.274,81
	August	16.320	8	64	130.560	14.795,67	1.524,33
	September	13.210	9	81	118.890	14.926,15	1.716,15
	October	12.360	10	100	123.600	15.056,63	2.696,63
	November	15.460	11	121	170.060	15.187,11	272,89
	December	21.420	12	144	257.040	15.317,59	6.102,41
TOTAL		330.044	-	1.300	169.622	-	59770,36

In the conditions of the alternative hypothesis H_1 , which proposes that the trend pattern for the X factor (the monthly sustainable marketing budgets, influencing the turnover of the company) is a **quadratic function** $x_i = a + b \cdot t_i + ct_i^2$, the parameters “a”, “b” and “c” are calculated using the following system of equations:

$$\begin{cases} n \cdot a + c \sum_{i=-m}^m t_i^2 = \sum_{i=-m}^m x_i \\ b \cdot \sum_{i=-m}^m t_i^2 = \sum_{i=-m}^m t_i \cdot x_i \\ a \cdot \sum_{i=-m}^m t_i^2 + c \sum_{i=-m}^m t_i^4 = \sum_{i=-m}^m t_i^2 \cdot x_i \end{cases} \quad (5)$$

Consequently,

$$a = \frac{\sum_{i=-m}^m t_i^4 \cdot \sum_{i=-m}^m x_i - \sum_{i=-m}^m t_i^2 \cdot \sum_{i=-m}^m t_i^2 \cdot x_i}{n \cdot \sum_{i=-m}^m t_i^4 - (\sum_{i=-m}^m t_i^2)^2} \quad (6),$$

$$b = \frac{\sum_{i=-m}^m t_i \cdot x_i}{\sum_{i=-m}^m t_i^2} \quad (7) \text{ and } c = \frac{n \cdot \sum_{i=-m}^m t_i^2 \cdot x_i - \sum_{i=-m}^m t_i^2 \cdot \sum_{i=-m}^m x_i}{n \cdot \sum_{i=-m}^m t_i^4 - (\sum_{i=-m}^m t_i^2)^2} \quad (8).$$

Using the statistical data that have been calculated to fit the quadratic function (Table 3), we are able to determine the following values for the parameters “a”, “b” and “c”:

$$a = \frac{121.420 \cdot 330.044 - 1.300 \cdot 18.373.556}{24 \cdot 121.420 - (1.300)^2} = 13.224,89$$

$$b = \frac{169.622}{1.300} = 130,48$$

$$c = \frac{24 \cdot 18.373.556 - 1.300 \cdot 330.044}{24 \cdot 121.420 - (1.300)^2} = 9,73$$

Thus, the coefficient of variation in the case of the quadratic function will be:

$$v_{II} = \left[\frac{\sum_{i=-m}^m |x_i - x_i^{II}|}{n} : \frac{\sum_{i=-m}^m x_i}{n} \right] \cdot 100 \Rightarrow v_{II} = \frac{\sum_{i=-m}^m |x_i - x_i^{II}|}{\sum_{i=-m}^m x_i} \cdot 100 \quad (9)$$

$$v_{II} = \frac{58.449,3}{330.044} \cdot 100 \Rightarrow v_{II} = 17,71\%$$

In the conditions of the alternative hypotheses H_2 , which proposes that the trend pattern for the X fac-

tor (the monthly sustainable marketing budgets, influencing the turnover of the company) is an **exponential function** $x_i = ab^{t_i}$, the parameters “a” and “b” are calculated using the following system of equations:

$$\begin{cases} n \cdot \ln a = \sum_{i=-m}^m \ln x_i \\ \ln b \cdot \sum_{i=-m}^m t_i^2 = \sum_{i=-m}^m t_i \cdot \ln x_i \end{cases} \quad (10)$$

$$\text{Consequently, } \ln a = \frac{\sum_{i=-m}^m \ln x_i}{n} \quad (11)$$

$$\text{and } \ln b = \frac{\sum_{i=-m}^m t_i \cdot \ln x_i}{\sum_{i=-m}^m t_i^2} \quad (12)$$

Using the statistical data that have been calculated to fit the exponential function (Table 4), we are able to determine the values associated with “ln a” and “ln b”:

$$\ln a = \frac{228,07}{24} = 9,50 \text{ and } \ln b = \frac{12,15}{1.300} = 0,0093$$

Thus, the coefficient of variation in the case of the exponential function will be:

$$v_{\exp} = \left[\frac{\sum_{i=-m}^m |x_i - x_i^{\exp}|}{n} : \frac{\sum_{i=-m}^m x_i}{n} \right] \cdot 100 \Rightarrow v_{\exp} = \frac{\sum_{i=-m}^m |x_i - x_i^{\exp}|}{\sum_{i=-m}^m x_i} \cdot 100 \quad (13)$$

$$v_{\exp} = \frac{58.672,02,68}{330.044} \cdot 100 \Rightarrow v_{\exp} = 17,78\%$$

We note the following relationships between the coefficients of variation related to the linear, quadratic and exponential functions of the sustainable marketing budgets dynamics observed in the company:

$$v_{II} = 17,71\% < v_{\exp} = 17,78\% < v_I = 18,11\%$$

We can conclude that the path described by the monthly sustainable marketing budgets, influencing the monthly turnovers reported by the company, is represented by a **quadratic trend** ($x_i = a + bt_i + ct_i^2$); to clarify, the first alternative hypothesis H_1 is confirmed.

Table 3. The pattern reflecting a quadratic function for the analysis of sustainable marketing budgets’ dynamics in the case of company

Year	Month	Monthly sustainable marketing budget (EURO) (xi)	Quadratic trend				
			t_i^2	t_i^4	$t_i^2 \cdot x_i$	$X_t = a + bt_i + ct_i^2$	$ x_i - x_t $
2012	January	11.470	144	20.736	1.651.680	13.060,25	1.590,25
	February	9.320	121	14.641	1.127.720	12.966,94	3.646,94
	March	12.850	100	10.000	1.285.000	12.893,09	43,09
	April	10.145	81	6.561	821.745	12.838,7	2.693,7
	May	14.140	64	4.096	904.960	12.803,77	1.336,23
	June	17.134	49	2.401	839.566	12.788,3	4.345,7
	July	18.460	36	1.296	664.560	12.792,29	5.667,71
	August	15.360	25	625	384.000	12.815,74	2.544,26
	September	12.640	16	256	202.240	12.858,65	218,65
	October	12.115	9	81	109.035	12.921,02	806,02
	November	11.430	4	16	45.720	13.002,85	1.572,85
	December	19.450	1	1	19.450	13.104,14	6.345,86
2013	January	10.840	1	1	10.840	13.365,1	2.525,1
	February	8.800	4	16	35.200	13.524,77	4.724,77
	March	10.390	9	81	93.510	13.703,9	3.313,9
	April	12.230	16	256	195.680	13.902,49	1.672,49
	May	13.200	25	625	330.000	14.120,54	920,54
	June	14.360	36	1.296	516.960	14.358,05	1,95
	July	16.940	49	2.401	830.060	14.615,02	2.324,98
	August	16.320	64	4.096	1.044.480	14.891,45	1.428,55
	September	13.210	81	6.561	1.070.010	15.187,34	1.977,34
	October	12.360	100	10.000	1.236.000	15.502,69	3.142,69
	November	15.460	121	14.641	1.870.660	15.837,5	377,5
	December	21.420	144	20.736	3.084.480	16.191,77	5.228,23
TOTAL		330.044	1.300	121.420	18.373.556		58.449,3

Table 4. The pattern reflecting an exponential function for the analysis of sustainable marketing budgets' dynamics in the case of company

Year	Month	Monthly sustainable marketing budget (EURO) (xi)	Exponential trend				
			$\ln x_i$	$t_i \ln x_i$	$\ln x_i = \ln a + t_i \cdot \ln b$	$x_i = ab^{t_i}$	$ x_i - x_{t_i} $
2012	January	11.470	9,35	- 112,17	9,39	11.948,97	478,97
	February	9.320	9,14	-100,54	9,40	12.060,61	2.740,61
	March	12.850	9,46	-94,61	9,41	12.173,30	676,70
	April	10.145	9,22	-83,02	9,42	12.287,04	2.142,04
	May	14.140	9,56	-76,45	9,43	12.401,84	1.738,16
	June	17.134	9,75	-68,24	9,43	12.517,71	4.616,29
	July	18.460	9,82	-58,94	9,44	12.634,67	5.825,33
	August	15.360	9,64	-48,20	9,45	12.752,72	2.607,28
	September	12.640	9,44	-37,78	9,46	12.871,88	231,88
	October	12.115	9,40	-28,21	9,47	12.992,14	877,14
	November	11.430	9,34	-18,69	9,48	13.113,53	1.683,53
	December	19.450	9,88	-9,88	9,49	13.236,06	6.213,94
2013	January	10.840	9,29	9,29	9,51	13.484,55	2.644,55
	February	8.800	9,08	18,17	9,52	13.610,54	4.810,54
	March	10.390	9,25	27,75	9,53	13.737,71	3.347,71
	April	12.230	9,41	37,65	9,54	13.866,07	1.636,07
	May	13.200	9,49	47,44	9,55	13.995,62	795,62
	June	14.360	9,57	57,43	9,56	14.126,39	233,61
	July	16.940	9,74	68,16	9,57	14.258,38	2.681,62
	August	16.320	9,70	77,60	9,57	14.391,60	1.928,40
	September	13.210	9,49	85,40	9,58	14.526,07	1.316,07
	October	12.360	9,42	94,22	9,59	14.661,79	2.301,79
	November	15.460	9,65	106,11	9,60	14.798,78	661,22
	December	21.420	9,97	119,66	9,61	14.937,05	6.482,95
TOTAL		330.044	228,07	12,15	-	58.672,02	

4.2 Analysis of the trend pattern related to monthly turnovers' dynamics

The second analysis is focused on the identification of the trend pattern reflecting monthly turnovers reported by the company during the period 2012-2013.

In the conditions of the null hypothesis H_0 , which proposes that the trend pattern for the X factor (the monthly turnovers, influenced by the monthly sustainable marketing budgets) is a **linear function** ($x_t = a + b \cdot t_t$), the parameters "a" and "b" are determined using the formula described in the previous section.

Using the statistical data that have been calculated to fit the linear function (Table 5), we are able to determine the following values for the parameters "a" and "b", using an Excel spreadsheet:

$$a = \frac{2.496.952}{24} = 104.039,67$$

$$\text{and } b = \frac{1.537.464}{1.300} = 1.182,66$$

Thus, the coefficient of variation in the case of the linear function will be:

$$v_l = \left[\frac{\sum_{i=-m}^m |x_i - x_i^l|}{n} : \frac{\sum_{i=-m}^m x_i}{n} \right] \cdot 100 \Rightarrow v_l = \frac{\sum_{i=-m}^m |x_i - x_i^l|}{\sum_{i=-m}^m x_i} \cdot 100 \quad (4)$$

$$v_l = \frac{414.054,08}{2.496.952} \cdot 100 \Rightarrow v_l = 16,58\%$$

In the conditions of the alternative hypothesis H_1 , which proposes that the trend pattern for the X factor (the monthly turnovers, influenced by the monthly sustainable marketing budgets) is a **quadratic function** ($x_t = a + b \cdot t_t + c t_t^2$), the parameters "a", "b" and "c" are calculated using the statistical data that have been calculated to fit the quadratic function (Table 6).

$$a = \frac{121.420 \cdot 2.496.952 - 1.300 \cdot 136.847.474}{24 \cdot 121.420 - (1.300)^2} = 102.344,78$$

$$b = \frac{1.537.464}{1.300} = 1.182,66$$

$$c = \frac{24 \cdot 136.847.474 - 1.300 \cdot 2.496.952}{24 \cdot 121.420 - (1.300)^2} = 31,29$$

Thus, the coefficient of variation in the case of the quadratic function will be:

$$v_{ll} = \left[\frac{\sum_{i=-m}^m |x_i - x_i^{ll}|}{n} : \frac{\sum_{i=-m}^m x_i}{n} \right] \cdot 100 \Rightarrow v_{ll} = \frac{\sum_{i=-m}^m |x_i - x_i^{ll}|}{\sum_{i=-m}^m x_i} \cdot 100 \quad (9)$$

$$v_{ll} = \frac{414846,7}{2.496.952} \cdot 100 \Rightarrow v_{ll} = 16,61\%$$

In the conditions of the alternative hypotheses H_2 , which proposes that the trend pattern for the X factor (the monthly turnovers, influenced by the monthly sustainable marketing budgets) is an **exponential function** ($x_t = a b^{t_t}$), the parameters "a" and "b" are calculated using the statistical data that have been calculated to fit the exponential function (Table 7).

$$\ln a = \frac{276,73}{24} = 11,53 \quad \ln b = \frac{14,76}{1.300} = 0,0114$$

Thus, the coefficient of variation in the case of the exponential function will be:

$$v_{exp} = \left[\frac{\sum_{i=-m}^m |x_i - x_i^{exp}|}{n} : \frac{\sum_{i=-m}^m x_i}{n} \right] \cdot 100 \Rightarrow v_{exp} = \frac{\sum_{i=-m}^m |x_i - x_i^{exp}|}{\sum_{i=-m}^m x_i} \cdot 100 \quad (13)$$

$$v_{exp} = \frac{406.513,21}{2.496.952} \cdot 100 \Rightarrow v_{exp} = 16,28\%$$

We remark the following relationships between the coefficients of variation related to the linear, quadratic and exponential functions in the case of the monthly turnovers dynamics observed in the company:

$$v_{exp} = 16,28\% < v_l = 16,58\% < v_{ll} = 16,61\%$$

We can conclude that the path described by the monthly turnovers, influenced by the monthly sustainable marketing budgets assigned by the company, is represented by an **exponential trend**; to clarify, the second alternative hypothesis H_2 is confirmed.

5. Conclusions and future research agenda

This study reveals that the process of identifying a trend model by using adequate statistical and mathematical tools provides a methodological framework for the appraisal of temporal monthly sustainable marketing

Table 5. The pattern reflecting a linear function for the analysis of monthly turnovers dynamics in the case of company

Year	Month	Monthly turnovers (EURO) (x_i)	Linear trend				
			t_i	t_i^2	$t_i x_i$	$x_i = a + bt_i$	$ x_i - x_{t_i} $
2012	January	78.322	-12	144	-939.864	89.847,75	11.525,75
	February	71.160	-11	121	-782.760	91.030,41	19.870,41
	March	86.468	-10	100	-864.680	92.213,07	5.745,07
	April	82.234	-9	81	-740.106	93.395,73	11.161,73
	May	107.236	-8	64	-857.888	94.578,39	12.657,61
	June	125.260	-7	49	-876.820	95.761,05	29.498,95
	July	114.207	-6	36	-685.242	96.943,71	17.263,29
	August	129.459	-5	25	-647.295	98.126,37	31.332,63
	September	104.460	-4	16	-417.840	99.309,03	5.150,97
	October	94.720	-3	9	-284.160	100.491,69	5.771,69
	November	96.236	-2	4	-192.472	101.674,35	5.438,35
	December	142.364	-1	1	-142.364	102.857,01	39.506,99
2013	January	88.260	1	1	88.260	105.222,3	16.962,33
	February	73.124	2	4	146.248	106.405	33.280,99
	March	78.360	3	9	235.080	107.587,7	29.227,65
	April	87.320	4	16	349.280	108.770,3	21.450,31
	May	96.240	5	25	481.200	109.953	13.712,97
	June	102.450	6	36	614.700	111.135,6	8.685,63
	July	123.236	7	49	862.652	112.318,3	10.917,71
	August	135.172	8	64	1.081.376	113.501	21.671,05
	September	115.576	9	81	1.040.184	114.683,6	892,39
	October	102.360	10	100	1.023.600	115.866,3	13.506,27
	November	106.361	11	121	1.169.971	117.048,9	10.687,93
	December	156.367	12	144	1.876.404	118.231,6	38.135,41
TOTAL		2.496.952	-	1.300	1.537.464	-	414.054,08

Table 6. The pattern reflecting a quadratic function for the analysis of monthly turnovers dynamics in the case of company

Year	Month	Monthly turnovers (EURO) (xi)	Quadratic trend				
			t_i^2	t_i^4	$t_i^2 \cdot x_i$	$X_i = a + bt_i + ct_i^2$	$ x_i - x_i $
2012	January	78.322	144	20.736	11.278.368	92.658,62	14.336,62
	February	71.160	121	14.641	8.610.360	93.121,61	21.961,61
	March	86.468	100	10.000	8.646.800	93.647,18	7.179,18
	April	82.234	81	6.561	6.660.954	94.235,33	12.001,33
	May	107.236	64	4.096	6.863.104	94.886,06	12.349,94
	June	125.260	49	2.401	6.137.740	95.599,37	29.660,63
	July	114.207	36	1.296	4.111.452	96.375,26	17.831,74
	August	129.459	25	625	3.236.475	97.213,73	32.245,27
	September	104.460	16	256	1.671.360	98.114,78	6.345,22
	October	94.720	9	81	852.480	99.078,41	4.358,41
	November	96.236	4	16	384.944	100.104,6	3.868,62
	December	142.364	1	1	142.364	101.193,4	41.170,59
2013	January	88.260	1	1	88.260	103.558,7	15.298,73
	February	73.124	4	16	292.496	104.835,3	31.711,26
	March	78.360	9	81	705.240	106.174,4	27.814,37
	April	87.320	16	256	1.397.120	107.576,1	20.256,06
	May	96.240	25	625	2.406.000	109.040,3	12.800,33
	June	102.450	36	1.296	3.688.200	110.567,2	8.117,18
	July	123.236	49	2.401	6.038.564	112.156,6	11.079,39
	August	135.172	64	4.096	8.651.008	113.808,6	21.363,38
	September	115.576	81	6.561	9.361.656	115.523,2	52,79
	October	102.360	100	10.000	10.236.000	117.300,4	14.940,38
	November	106.361	121	14.641	12.869.681	119.140,1	12.779,13
	December	156.367	144	20.736	22.516.848	121.042,5	35.324,54
TOTAL		2.496.952	1.300	121.420	136.847.474		414846,7

Table 7. The pattern reflecting an exponential function for the analysis of sustainable marketing budgets' dynamics in the case of company

Year	Month	Monthly sustainable marketing budget (EURO) (xi)	Exponential trend				
			$\ln x_i$	$t_i \ln x_i$	$\ln x_i = \ln a + t_i \cdot \ln b$	$x_i = ab^{t_i}$	$ x_i - x_i $
2012	January	78.322	11,27	-135,22	11,39	88.716,40	10.394,40
	February	71.160	11,17	-122,90	11,40	89.733,55	18.573,55
	March	86.468	11,37	-113,68	11,42	90.762,37	4.294,37
	April	82.234	11,32	-101,86	11,43	91.802,98	9.568,98
	May	107.236	11,58	-92,66	11,44	92.855,52	14.380,48
	June	125.260	11,74	-82,17	11,45	93.920,13	31.339,87
	July	114.207	11,65	-69,87	11,46	94.996,94	19.210,06
	August	129.459	11,77	-58,86	11,47	96.086,11	33.372,89
	September	104.460	11,56	-46,23	11,48	97.187,75	7.272,25
	October	94.720	11,46	-34,38	11,50	98.302,03	3.582,03
	November	96.236	11,47	-22,95	11,51	99.429,09	3.193,09
	December	142.364	11,87	-11,87	11,52	100.569,07	41.794,93
2013	January	88.260	11,39	11,39	11,54	102.888,38	14.628,38
	February	73.124	11,20	22,40	11,55	104.068,02	30.944,02
	March	78.360	11,27	33,81	11,56	105.261,18	26.901,18
	April	87.320	11,38	45,51	11,58	106.468,03	19.148,03
	May	96.240	11,47	57,37	11,59	107.688,71	11.448,71
	June	102.450	11,54	69,22	11,60	108.923,38	6.473,38
	July	123.236	11,72	82,05	11,61	110.172,21	13.063,79
	August	135.172	11,81	94,51	11,62	111.435,36	23.736,64
	September	115.576	11,66	104,92	11,63	112.713,00	2.863,00
	October	102.360	11,54	115,36	11,64	114.005,28	11.645,28
	November	106.361	11,57	127,32	11,66	115.312,37	8.951,37
	December	156.367	11,96	143,52	11,67	116.634,45	39.732,55
TOTAL		2.496.952	276,73	14,76	-	-	406.513,21

budgets' impact on the monthly turnovers of a company. Furthermore, the use of the coefficient of variation method allows the identification of the longitudinal data homogeneity, reflecting the dynamics of the indicators, sustainable marketing budgets and turnovers.

In addition, it is important to emphasize the primary principle of the methodology employed, reflecting that when the variation coefficient has a lower value, the homogenization of the data is greater. In this context, we note lower levels of variation coefficients in the case of monthly turnovers.

This study was limited to only one company in the retailing industry. Although the results cannot be generalized, they provide interesting insights. The dynamics of the monthly sustainable marketing budgets, reflected by a quadratic trend, has a significant impact on the monthly turnover dynamics, reflected by an exponential trend. This valuable research outcome lets us argue, based on empirical results, the increasing role of sustainable marketing initiatives in supporting higher financial results in the long term. Therefore, managers should balance financial resources by investing more in sustainable activities.

In addition, the limitations of this study provide additional opportunities for research directions. We are aware that additional studies should be conducted in this area and the future research agenda includes the design of an appraisal model that will assess the results described above; the research will focus on the use of the test series analysis, the augmented Dickey-Fuller test (ADF), that allows the determination of stationary or non-stationary dynamics of a series by determining the deterministic trend indicated by the coefficient of variation method.

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