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IMPACT OF INNOVATION ON THE MARKET VALUE OF TOURISM ENTERPRISES: APPROACHES AND METRICS

Abstract: The purpose of this research was to integrate existing knowledge regarding the effects of innovation on the value of tourism enterprises.

The research is based on a literature review. This was performed through the use of the Ebsco electronic database, due to the high accessibility of its information. The review encompassed the metrics of investor responses and related analytical models. The relevant papers referred to key financial factors under headings such as the market value of innovation, innovation driven value creation, and investment valuation.

The research identified five approaches and three metrics which were most commonly used in empirical studies on the effects of innovation. Moreover, it enabled the concepts of investor responses and market efficiency to be delineated.

The paper attempts to fill an important research gap concerning the impact of innovation on the value of tourism enterprises.

Keywords: innovation, tourism enterprises, market value.

JEL classification: L83, G32, D53.

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Streszczenie: Celem artykułu było usystematyzowanie wiedzy dotyczącej wpływu innowacji na wartość przedsiębiorstw turystycznych.

W badaniu wykorzystano metodę studiów literaturowych. Ze względu na liczbę dostępnych informacji posłużono się elektroniczną bazą danych – Ebsco. Przeanalizo-

wano podejścia badawcze i miary odnoszące się do reakcji inwestorów na informacje płynące z rynku. Badane publikacje koncentrowały się na najważniejszych aspektach finansowych jak rynkowa wycena innowacji, kreacja wartości opartej na innowacjach i wycena inwestycji.

Badanie pozwoliło na wskazanie pięciu podejść badawczych i trzech miar najczęściej wykorzystywanych w badaniach empirycznych dotyczących efektów innowacji. Pozwoliło ponadto na analizę teoretycznych podstaw reakcji inwestorów i efektywności rynków.

Artykuł stanowi próbę wypełnienia istotnej luki poznawczej dotyczącej zależności pomiędzy innowacjami i wartością przedsiębiorstw turystycznych.

Słowa kluczowe: innowacja, przedsiębiorstwo turystyczne, wartość rynkowa.

Introduction

The scientific focus on the different aspects of innovation is constantly growing. Joseph Schumpeter distinguished innovation clearly from invention and described it as: “the setting up of a new production function”, which “covers the case of a new commodity, as well as those of a new form of organization such as a merger, of the opening up of new markets, and so on” [Schumpeter 1939, pp. 80–82]. In other words: “innovation combines factors in a new way” [Schumpeter 1939, pp. 84]. Innovation can also be defined with reference to monetary costs: “total costs to individual firms must, in the absence of innovation and with constant prices of factors, monotonically increase in function of their output” [Schumpeter 1939, p. 85].

It is generally recognised that tourism entities operate in an extremely competitive sector. Such a situation means innovative activity is indispensable for the successful operation and survival of tourism companies [Szutowski i Bednarska 2014, p. 208]. Innovation can take a variety of forms and can be classified in different ways. At the same time, it seems that in the case of tourism companies any suitable classification should not only cover innovation in products/services, processes and marketing, but also organizational, distributional and institutional innovation [Szutowski 2014].

The significance of innovation stems from its ability to stimulate an organizational learning climate; fostering improvements, renewal and the ability to learn from past failures [Gunday et al. 2011, p. 664]. Moreover, the critical importance of innovation originates from its multidimensionality. The successful implementation of different types of innovation can result in achieving

the following goals: reinforcement of market share, enhancing product quality, reaching new markets, controlling production cost, improving management performance, and flexibility in production [Quadros et al. 2001, p. 204; Walker, Damanpour and Devece 2011, pp. 370–373].

The mainstream innovation literature omits the tourism industry, so a knowledge gap exists that requires investigation. As Hjalager points out, the emphasis on tourism in mainstream innovation research is growing, but still insufficient [2002, p. 1]. Occasional there is a recognition of tourism specificities such as low spending on R&D [Cheng 2011, p. 1333], the provision and consumption of services at the same time [Harris 1999, p. 21], and the importance of the human factor [Vila, Enz and Costa 2012, p. 81]. Moreover, tourism entities are strongly differentiated by their type of economic activity [UNWTO 2010]. The same innovation may produce different effects in accommodation, food and beverage servicing, passenger transportation, and travel agencies. What seems especially important is the relationship between innovation and the economic performance of tourism enterprises [Nicolau and Santa-Maria 2013, p. 71].

Moreover, the research reported in the present paper was focused on public companies. This was due to the fact that they operate in a respected and balanced regulatory environment, remain transparent to the public, and comply with the best corporate governance practices [London Stock Exchange 2010]. Furthermore, public companies undergo annual audits, set up appropriate communication channels, and provide up-to-date information distribution [Nasdaq OMX].

The constant adjustments in the value of public companies are vital for managers and investors. At the same time, innovation projects are among the most important predictors of fluctuations in companies' market value. From this perspective measuring the impact of innovation on the market value of tourism enterprises seems essential as investors decide the value of public companies. Therefore, measurement should cover investors' reactions to any upcoming information on innovation. Moreover, approaches that rely on market value outnumber those based on accounting data. Recent research has shown that investors react favourably to both: actual innovation as well as announcements on potential future projects [Sood and Tellis 2009, pp. 450–451].

The research problem is expressed in the following question: what are the approaches and metrics appropriate for measuring the impact of innovation on the market value of tourism enterprises? The research aims at summarizing the present knowledge on the topic.

The paper is organised as follows. First, the conceptual framework is presented. Second, the research method is outlined. Third, five approaches suitable for measuring the impact of innovation on the market value of tourism enterprises are summarised. Forth, the pros and cons of the chosen metrics are discussed. The paper ends with the conclusions and directions for further research.

1. Conceptual framework

The notion of market value is crucial for the present research. It has been defined by the International Valuation Standards Council as follows: “the estimated amount for which an asset or liability should exchange on the valuation date between a willing buyer and a willing seller in an arm’s length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion” [International 2013].

The easiest way to compute a firm’s market value is to multiply the price of its shares by the number of outstanding shares [Bhatawedekhar, Jacobson and Hamade 2005, p. 27; Nicolau and Santa-Maria 2013, p. 72]. The measure of market value delivers a forward-looking perspective on investors’ prediction of a firm’s future cash flows. The usage of market value measure requires the adoption of the random walk presumption, which states that stock prices integrate all the existing knowledge about a company and that any new information is incorporated immediately.

The efficient-market hypothesis (EMH) relies on the informational efficiency of the financial markets and assumes that prices fully reflect all the available information [Fama 1965, p. 58, Fama, 1970, p. 384]. Any highly efficient market is presumed to generate random and unpredictable sequences of price changes. The hypothesis states that consistently achieving returns exceeding the market average is impossible. There are three main forms of the EMH [Fama, 1970, p. 389, 404 and 409]: weak, semi-strong and strong, all of which deliver different explanations on market functioning. The weak form assumes that current asset prices reflect all the publicly available information from the past (it is criticised for claiming prices must be random walk, even though over-time trends have been empirically proven and can be predicted). The semi-strong form holds, in addition, that asset prices reflect upcoming publicly available information instantly. The strong form claims that prices not only reflect publicly available information, but also insider and hidden information (this latter presumption precludes empirical tests). “For their

empirical analysis of asset prices”, Eugene Fama, Lars Peter Hansen and Robert Shiller were awarded *The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2013* [Economic 2013].

Despite its strong theoretical and empirical background the hypothesis is by no means certain and has been criticised in the financial press both before [Hilsernath 2004] and after the financial crisis of 2008 [Nocera 2009; Cassidy 2010; Simkovic 2009]. The critique concerns mainly the assumption of perfect unbiased information sharing, immediate investor responses, as well as their absolute rationality. However, as Pauwels et al. [2004, p. 144] claim, “the efficient market perspective also acknowledges that investors do not always correctly and immediately forecast the firm’s future returns”. Finally, market valuation can be misleading, as shares can be priced with a discount or a premium, depending on the market situation [Bhatawedekhar, Jacobson and Hamade 2005, p. 28].

There still is an on-going debate among researchers and practitioners whether EMH is the proper theoretical framework for understanding modern market processes [Lo 2007]. Regardless of the abovementioned criticism, the semi-strong efficient-market hypothesis is broadly accepted in financial and strategic literature [Sharma and Lacey 2004, p. 299]. Also, it is commonly used in empirical research [Pauwels et al. 2004; Sharma and Lacey 2004; Sorescu, Shankar and Kushwaha 2007; Hanssens, Rust and Srivastava 2009]. As Fama [2011] claims, “the market can’t resolve uncertainties that are unresolvable”. Consequently, economic uncertainty, different levels of risk aversion and volatility in prices are common phenomena. The fact that the market does not anticipate future stock prices at all times does not preclude its efficiency [Fama 2011]. If the random walk theory is valid, EMH remains true for most investors. In such a situation the practical application of market efficiency assumptions also holds for investment purposes [Elbarghouthi, Quasim and Yassin 2012, p. 167].

However, in order to adapt the theory to contemporary requirements some modification is essential. The assumption of investor rationality is maintained but that one concerning their immediate reaction is abandoned [Brav and Heaton 2002; Brennan and Xia 2001]. Such a modification builds on the isolation of two types of investor and two types of economic model. Brav and Heaton [2002, p. 577] isolated two types of investor: underreacting (due to their conservatism [Edwards 1968, in: Brav and Heaton 2002, p. 581]) and overreacting (due to the phenomenon of “representative heuristic” [Kahneman and Tversky 1972, in: Brav and Heaton 2002, p. 580]). Underreacting-investors overestimate prior beliefs and underestimate recent data. Overreacting-investors overestimate current evidence and disregard previous beliefs [Brav and Heaton 2002, p. 580].

The authors also distinguished between two types of model – behavioural and structural uncertainty [Brav and Heaton 2002]. In the first one, investors can act irrationally, but they know “the relevant structural feature of the economy” [Brav and Heaton 2002, p. 579]. The structural uncertainty model is the reverse – investors act rationally, yet they remain uncertain about the relevant structural feature of the economy [Brav and Heaton 2002, p. 579]. Employing Bayesian methods, investors remain axiomatically rational. Therefore, financial anomalies result from the uncertainty of whether the probability of generating the predicted return from the asset is stable (time invariant) or unstable (fluctuating through time). In the present research, the rationality of investors remains valid.

The immediate investor response was examined in the light of market anomalies. An anomaly was defined as a statistically significant difference between the returns predicted by a particular pricing model and those actually achieved by the securities [Brennan and Xia 2001, p. 905]. There are few cases in which an investor can judge confidently if the anomaly occurring against the pricing model is merely apparent or genuine [Brennan and Xia 2001, p. 905]. Any investor who wants to exploit the anomaly has to address three issues [Brennan and Xia 2001, p. 906]. The first one is if the anomaly is consistent with any of the existing asset pricing models. If this is not the case, an investor may withhold his/hers assets. However, being reasonable he/she attributes some probability to the genuineness of the anomaly. The investor waits, observes the returns, and revises the probability of the anomaly being genuine. Over time an investor can recognise its genuineness. The second issue is whether to invest in the anomaly or not. An investor bears in mind that the returns from the anomaly are an unknown parameter, which can only be estimated. But an investor can recognise returns over time. The third issue can be expressed in two questions. What are chances for the anomaly to persist in the future (assuming that the anomaly is genuine)? What is the rate at which the anomaly is removed by trading from other investors (assuming that anomaly is merely apparent)?

2. Research method

The present research was aimed at integrating existing knowledge about the effects of innovation on the value of tourism enterprises. In order to summarise existing works, a literature review was carried out [Grant and Booth 2009, p. 97]. The body of literature gathered was summarised and synthesised

in line with the existing research gap. Rather than a manual search an electronic database was used due to the high accessibility of its information; with Ebsco (<http://web.ebscohost.com>) being selected as an appropriate tool. The following search-terms were chosen for the research: “innovation”, “novelty”, “improvement”, “market value”, “firm value”, “value creation”, “investment valuation”, “tourism enterprise”, and “hospitality”. Different combinations of the search-terms were constructed by using Boolean operators. Both American and British spellings were checked, and the time frame covered the period between 2000 and the present. The only exception was in allowing some earlier works by Fama and Schumpeter that were considered influential [Paniagua 2002 in: Cronin, Ryan and Coughlan 2008, p. 40]. Books were included in the research but journals were generally considered as more up-to-date [Cronin, Ryan and Coughlan 2008, p. 40]. Both empirical and theoretical/conceptual papers were analysed.

The research procedure resulted in identifying 103 papers. However, due to their marked differentiation a selection procedure was performed. The initial overview of the created set of papers covered an analysis of the abstracts and summaries. In this step 52 papers were excluded, not having any approach or metric suitable from the point of view of the current research. Next, materials were selectively chosen from those remaining, based on the full texts of the papers. This procedure resulted in the identification of 22 papers containing approaches and metrics appropriate for studying the effects of innovation on the value of tourism enterprises. However, only two papers referred directly to tourism enterprises. Therefore, the existence of an important research gap was confirmed.

Critical and systematic reviews of the content were performed and the approaches and metrics proposed in the studied set of articles were compared to one another. This procedure resulted in identifying five approaches that are presented in section four, and three metrics described in section five. Additional information concerning each item was searched, establishing the names of these approaches and metrics as keywords.

3. Approaches

In order to measure the effects of innovation on the value of tourism enterprises, different approaches may be used. An approach is defined as: “a way of dealing with a situation or problem” [Oxford English Dictionary]. In order to select these approaches a content analysis of 22 publications was performed.

All the papers were compared with each another and divided into groups based on the approaches used. A total of five different approaches were used, all matching the theoretical assumptions mentioned in section 2. The chosen approaches are presented below.

3.1. Event-study

The scientific potential of event-study analysis is best reflected in situations where the impact of a specific event on the value of a firm needs to be measured [Sorescu, Chandy and Prabhu 2003, pp. 99–100]. The approach is based on the simple concept of cause and effect. It may be described as quasi-experimental, due to the strictly defined conditions for such studies.

The approach relies on measuring investors' reaction to an unanticipated event, and the time during which the reaction occurs is called a window. This window surrounds the event and the investors' reaction is represented by any abnormal return, i.e. the difference between the ex post returns and the returns predicted by an economic model [Nicolau and Santa-Maria 2013, p. 75]. Any abnormal return (AR) can be measured using the CAR (cumulative abnormal return) or BHAR (buy-and-hold return) models [Belghitar and Dixon, 2012, p. 38]. The first one analyses the abnormal return relative to an economic model, e.g. Carhart's four-factor model (the estimation is straightforward, but all four factors can rarely be controlled). This can be used in short test periods. The second one is suitable for long test periods as it measures any abnormal return resulting from holding the assets for a long period.

The event-study approach is characterised by a number of pros and cons. The strength of the approach stems from the use of market valuation, which eliminates being dependent on the accounting data. Also, the information requirement is low [Sharma and Lacey 2004, pp. 301–302]. The use of the event-study approach presupposes an assumption of market efficiency, investor rationality, and perfect information availability. Therefore, the effects of an event are presumed to be reflected in stock prices immediately. Moreover, event-studies require the effects of events to be clearly isolated one from another. Overlapping event windows are not allowed [Nicolau and Santa-Maria 2013, p. 75], which may be problematic in long-term studies (the longer the window, the higher the chance for overlap). The main issue resulting from overlapping is that it leads to them sharing a common measurement period and requires cross-sectional correlations between observations. On one hand the effects of overlapping events concerning a company can correlate due to the same endogenous data being shared in the overlapping periods. On the

other hand, the effects of overlapping events concerning different companies can also correlate due to the sharing of industry – or market-wide events. Cross-sectional correlations distort standard errors towards zero, inflating t-statistics and misleading statistical reasoning [Mitchell and Stafford 2000].

As Brav and Heaton [2000, p. 49] state, implementing the event-study approach in research can result in one of four situations, which represent the different patterns of abnormal returns. All of the patterns differ in their pre-event, event-day and post-event signs regarding abnormal returns. The examples are presented in Table 1.

Table 1. Cases of investor reactions in event-studies

	Pre-event	Event-day	Post-event
Case A	+	+	+
Case B	–	–	–
Case C	+	–	–
Case D	–	+	+

Source: [Brav and Heaton 2000, p. 49].

The above four cases clearly reflect the simplicity of the approach. Yet, in practical application, the abnormal return is contained in only one of them. In order to perform an in-depth analysis of the effects of innovation on the value of tourism enterprises, more advanced approaches are needed.

3.2. Stock return response model

The advantage of the event-study approach is its simplicity. However, it has an important limitation as it disregards continuous actions in the analysis [Mizik and Jacobson 2009, p. 320]. In cases where the actions cannot be specified as a specific event, the stock return response model needs to be applied [Pauwels et al. 2004, p. 144]. Examples of continuous actions influencing investors' reactions are R&D and marketing expenditures [Srinivasan et al. 2009, p. 30]. Even if the effect of the continuous action can take the form of a specific event (e.g. new product announcement), the expenditure itself is spread over time.

Similarly to event-study, the stock return response model relies on time windows [Kimbrough and Mcalister 2009, p. 315]. However, the latter approach allows for the inclusion of variables representing company characteristics and actions, which enables their impact on a firm's market value to be tested [Srinivasan et al. 2009, p. 30]. The variables can be grouped into different

categories e.g.: financial results (e.g. changes in earnings and revenues), customer's assets (e.g. changes in customer satisfaction and brand equity), as well as marketing actions and innovation (e.g. changes in innovation policies and strategies). The variables represent unanticipated changes in company characteristics along with unexpected events.

The main pros and cons of the stock return response model are as follows. The approach regards events as signals [Srinivasan et al. 2009, p. 31], which permits various interpretations of the results to be introduced. Certain kinds of signal can be interpreted differently. Intensified R&D expenditure can be seen either as a reduction in future cash flows by reason of diminished profit margins, or as a sign of company weakness resulting from sales issues regarding current products. Therefore, the inferences are not as straightforward as in event-studies [Kimbrough and McAlister 2009, p. 316]. The main weakness of this approach is that it is necessary for it to be represented by a single equation, which results from the impossibility of representing the system as a whole. Also, which is important in practical application, the data requirements are high, and information from the company's internal environment may be necessary.

3.3. Calendar portfolio

In order to overcome the issues of cross-sectional correlation and high data requirements the calendar-time portfolio approach was introduced [Sorescu, Shankar and Kushwaha 2007, p. 474]. The approach relies on putting the effects of all the events into one hypothetical portfolio and producing a single abnormal return for the whole sample. The stocks, which form the portfolio, are purchased one by one when the consecutive events occur [Seasholes and Zhu 2010, p. 1988–89]. Equal investments are made in each one. The stocks are kept in the portfolio for a predetermined period and then the positions are liquidated [Sorescu, Shankar and Kushwaha 2007, p. 485]. In general, different portfolio construction strategies are permitted. Such strategies may cover: long-position investment strategy, similar-stocks investment strategy, and a zero-cost investment strategy [Benzoni and Schenone 2010, p. 237].

As Mitchell and Stafford [2000, p. 289] claim, a random series of positive and negative events in a random sample generate an average calendar-time portfolio abnormal return equalling zero. Consequently, the effects of all the characteristic events equal zero. Therefore, all the nonzero results can be assigned to the studied event.

For the studies relying on time-series data, it is advisable to use the Carhart four-factor model for calculating abnormal returns [Byun and Rozeff 2003, p. 1071]. This approach allows the independent variable's effect to be measured [Boehme and Sorescu 2002, pp. 875–876]. The procedure is based on the construction of two calendar-time portfolios, which differ in the values of the independent variable. The first one contains companies with values greater than the median. The second one contains companies with values below it. Comparison of the intercepts from the two portfolios allows the independent variable's effect on long-term abnormal returns to be determined [Sorescu, Shankar and Kushwaha 2007, p. 485].

The main pros of the approach include low data requirements and the use of market valuation. Moreover, in practical application, the portfolios often comprise companies from one sector, which decreases the chance of omitting important sector variables [Su and Lin 2012, p. 206]. In other words, the more firms from one sector there are, the smaller the risk of omitting important variables. The main con covers practical issues in constructing an appropriate portfolio for reference. Moreover, the approach implies that all the events are given the same weight. However, the potential problems in establishing a reference portfolio can be overcome by introducing a single company for reference.

3.4. Matched firm returns

The matched firm returns (MFR) approach attempts to overcome the issues of cross-sectional dependency and reference portfolio creation. The approach is based on a one-to-one comparison between the target company, which experiences the event, and a matched company [Goux and Maurin 2000, p. 5]. The companies should be as close as possible in their main characteristics (e.g. the four factors of the Carhart model), and the difference between the returns of both firms represents the abnormal return resulting from the event [Filbeck, Krueger and Preece 2007, p. 3]. That is to say the approach is built on a comparison between the “test” and the “control” firms; with the “test” representing an event which did not occur in the “control”.

In practical application, the data can be analysed using the vector autoregressive model (VAR). Therefore, several endogenous variables (e.g. advertising, sales revenue, profit, R&D expenditure and stock returns) can be analysed at the same time. The innovation variable can represent the total number of innovation announcements for a period/firm. As Joshi and Hanssens state [2010, p. 26] the innovation announcements should cover those related to

development activities (i.e. patents), setup activities (i.e. grants), and market activities (i.e. actual launches).

The main con of the approach concerns the choice of an appropriate matched company [Goux and Maurin 2000, p. 5]. First, there may be no company with the necessary characteristics. Second, the issue of mutual matching can occur. In such cases, firm X is a match for firm Y, but this implies that Y is a match for X. This results in values of equal magnitude with opposite signs [Joshi and Hanssens 2010, p. 23]. The method's important strength results from its high practical applicability and accuracy [Barber and Lyon, in: Joshi and Hanssens 2010, p. 23]. However, the approach does not permit any representation of the whole system, which is the strength of the persistence modelling approach.

3.5. Persistence modelling

Persistence modelling differs from other approaches in eliminating the single-equation perspective and introducing a representation of the whole system. A number of equations are attributed to important agents; e.g. investors, competitors, and consumers. The events are presumed to generate a chain reaction in the series of equations [Srinivasan et al. 2004, p. 11; Joshi and Hanssens 2004, pp. 120–121]. Therefore, the consequences of an initial shock can continue well beyond the direct effects [Pauwels et al., 2004, p. 145; Dekimpe and Hanssens 2005, p. 10].

The persistence modelling approach functions irrespective of the time investors react. Therefore the assumption of market efficiency is unnecessary. The lagged terms are added to every variable. If the investors react immediately, the lagged terms equal zero. If the investors react slowly, lagged terms are generated. The greater the lag terms the slower the investors' reaction [Dekimpe and Hanssens 2005, p. 6].

In practical application, persistence modelling often takes form of VAR models and related impulse response functions (IRF). The IRFs are the functions that track the evolution of variables after the event occurs. Thus, they trace the changes over time [Pauwels et al. 2004, pp. 145–146].

The main cons of the approach are the high data requirements and over-parametrisation. The main pros are the possibility of representing the system as a whole and its accuracy.

The present research assessed five approaches which can be used to study the effects of innovation on the value of tourism enterprises: event-study, stock return response model, calendar-portfolio, matched firm returns, and

persistent modelling. The approaches differ significantly from one another. The choice of an appropriate approach depends on the purpose of the particular research and the availability of data, and the limitations and pros and cons of each should be taken into consideration. Examples of all the above mentioned approaches are clearly summarized in Table 2; where their metrics, methodologies, and comments are listed.

Table 2. Examples of the approaches used to examine the relationship between innovation and a company's economic performance

Author	Approaches	Metrics	Methodology	Comments
Nicolau and Santa-Maria 2013	Event-study	Company valuation, stock returns	Following data collection process of McWilliams and Siegel, 1997; 2 firms, 24 innovation announcements, 1996–2008	Authors measured the impact of innovation on the market value of hotel enterprises
Pauwels et al. 2004	Stock return response model	Revenue, income, firm value	VAR model, marketing and financial databases; 1,100 dealerships, 1996–2001	Authors studied the effects of new product introductions in the automobile industry
Sorescu et al. 2007	Calendar-portfolio	Stock returns	Research in 2 publications, 1984–2000; 419 pre-announcements, 100 firms	Authors studied pre-announcements of new products in software, hardware industries
Joshi, Hanssens 2010	MFR	Company value	Impulse response functions, 1991–2005; nine companies	Authors examined the exogenous innovation variable in the PC manufacturing and sporting goods industries
Srinivasan et al. 2004	Persistence modelling	Revenue, income, company value	VAR model, marketing and financial databases; 1,100 dealerships, 1996–2001	Authors studied the effects of new product introductions in the automobile industry

The choice of a suitable approach for a particular piece of research needs to be followed by the choice of a suitable metric. The three metrics most commonly used in the set of articles studied are presented in the next chapter.

4. Metrics

The adoption of a particular approach to measure the effects of innovation on the value of tourism enterprises requires the choice of a suitable metric. In this section the three metrics most commonly used in the set of articles studied are presented. The selected metrics, and the number of research papers which used them, are as follows: company valuation ($n = 4$), stock returns ($n = 3$), and Tobin's Q/market-to-book ratio ($n = 5$). It should be born in mind that a metric can be defined as: "a system or standard of measurement" [Oxford English Dictionary]; or in a more business-oriented way as: "a set of figures or statistics that measure results" [Oxford English Dictionary].

4.1. Company valuation

In order to manage company's value, a manager must understand how to measure it and how it will respond to his or hers actions [Joshi and Hanssens 2010, p. 22]. Company value stands for the discounted value of future cash flows. One can value either the equity of the firm (free cash flow to equity – FCFE is used in this case), or its equity and debt (using free cash flow only – FCF). In the valuation process, both values are complemented by the terminal value, which represents the predicted cash flows occurring beyond the forecast period. The discount rate, which reflects mainly the riskiness of cash flows, can take the form of the leveraged cost of equity, weighted average cost of capital (WACC), or unleveraged cost of equity [Spindt, pp. 2–3].

The value of public companies is fully determined by the market. In this case no complicated calculation is necessary to obtain a company's market value. The easiest way to estimate it is to multiply the stock price by the number of outstanding shares [Nicolau and Santa-Maria 2013, p. 72]. This measure delivers a forward-looking perspective on investors' estimation of a firm's future cash flows. The company valuation metric relies on market efficiency, and the random walk of stock prices. This means that, in theory, stock prices integrate all the existing knowledge on a company and any new information is incorporated immediately, which in practice is not always the case [Belenzon 2011, p. 283].

The main pros of the company value metric relate to its up-to-date character and high data availability. Stock exchanges publish all the necessary data on public companies, on an on-going basis. The main con of the metric is that the market value can be misleading, as shares can be priced with a discount or with a premium, depending on the market situation [Sharma and Lacey 2004, p. 299].

4.2. Stock returns

As Sood and Tellis [2009, p. 442] state, the true reward to innovation is represented by the abnormal stock returns. Stock returns stand for the fluctuations of the value of investment in company's stock [Nicolau and Santa-Maria 2013, p. 75]. Stock returns change over time and take the form of time series. The total stock return is represented by the quotient of the stock price after the appreciation/depreciation divided by the initial price. Moreover, the stock returns metric includes the dividend payments. Usually the stock return is presented as a percentage. In order to obtain the return in cash, the gains from the price appreciation need to be added to the cashed dividends [Finance Formulas]. There is a strong relation between firm size and its average returns on stocks. Moreover, there is a cross-sectional relation between the book-to-market equity and the average stock returns [Fama 1992]. However, there is no relation between the stock returns and firm's Beta [Fama 1992].

The main strength of the stock returns metric is that it allows analysing the time-series data. Similarly to the value of the firm metric, the main weakness of the stock returns is that the discounts and premiums are attributed to shares' values.

4.3. Tobin's Q/Market-to-book ratio

The Tobin's Q metric represents the relationship between the market value of a company and the replacement cost of its assets [Joshi and Hanssens 2004, p. 11]. Values of Q greater than one indicate the positive contribution of intangibilities to the market valuation. The metric is widely accepted in the financial literature [Sorescu and Spanjol 2008, p. 117].

An important strength of Tobin's Q consists in allowing the comparison of enterprises from different sectors. Furthermore, the strength of this metric stems from delivering a market-based view. The main issue concerns the precise calculation of the replacement costs. Yet, in most cases only the annual or monthly data are available.

The Tobin's Q metric can be replaced by the market-to-book ratio (MBR) in order to overcome the above difficulties [Mizik and Jacobson 2009, p. 323]. The MBR represents the relationship between the market value of a company and the book value of its equity. In the case of MBR, the data requirements are low as the book value is more accessible than the replacement costs of the assets. The concepts of both Tobin's Q and MBR rely on the random walk assumption of stock prices. However, in practice, Tobin's Q and MBR rarely outperform the metric of stock returns [Mizik and Jacobson 2009, p. 322].

The metrics of company value, stock returns, and Tobin's Q/market-to-book ratio were the most commonly used in the set of articles studied. However, various authors also proposed the metrics of revenue and income [Srinivasan et al. 2004], as well as overall company performance [Sharma and Lacey 2004].

Conclusions

The research reported in the set of articles studied focused on the impact of innovation on the value of tourism enterprises. They were conducted using different approaches and metrics. In order to summarize the data, a content analysis was performed. First, it was confirmed that the effects of innovation occurred over both the short – and long-term. Therefore, in order to capture both effects, the joint use of event-study and calendar-time-portfolio approaches was required. Second, the research indicated that metrics based on market data surpassed those based on accounting information. Furthermore, market value was indicated as the most reliable metric. Third, the abovementioned approaches and metrics possessed low data requirements, and captured important sector variables, which indicated their high practical applicability.

The reported set of approaches and metrics resulting from these literature studies require further investigation. The effects of various other variables relating to innovation need to be investigated. Furthermore, what seems especially interesting is the type of events investors most willingly respond to. Also, the characteristics of the communication process between a tourism company and investors remain unstudied. In addition, it seems necessary to investigate the time required by investors to incorporate new information into their valuations. Finally, in this research the specificity of the tourism sector could not be properly addressed due to the fact that only two publications focused on tourism enterprises. The possibilities of including sector specific features into the proposed approaches should be analysed.

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