Influential Article Review - A Comprehensive Study Distinguishing the Black and Scholes Framework

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This paper examines business models. We present insights from a highly influential paper. Here are the highlights from this paper: The aim of the paper is to investigate the Black and Scholes model by providing an updated framework of the international literature on the topic, within the field of real option. The purpose of the research is to identify the relevant literature between 1999 and 2015, together with the most important perspectives on the Black and Scholes model as analysed by scholars, in order to provide a useful support to the academic community in their studies. The investigation was carried out only for its economic and corporate insights, with the objective of establishing the strong and weak points highlighted in the defined framework. The method used for the research was based on qualitative approach. International literature on the topic was examined through a research protocol. The research was developed by the identification of four keywords (Real Options Valuation, Real Options Assessment, Black and Scholes, Real Options Pricing) and searching them in two databases, with the purpose of obtaining a wide range of scientific contribution for the analysis. The paper presents an accurate review of the scientific contribution on the topic of the Black and Scholes model; it defines the fields of application, opportunities offered and issues relating to its application, in order to clarify the strong and weak points of the model. The Black and Scholes model of the 1970s is acknowledged to be the most widely used model for evaluating options. Our study shows that this method has been adopted by decision-makers not only for evaluating options but also in other fields. For our overseas readers, we then present the insights from this paper in Spanish, French, Portuguese, and German.

Keywords: Real options valuation, Real options assessment, Black and Scholes, Real options pricing

SUMMARY

- The Black and Scholes formula is the most widely known model used for evaluating options. It has been used since the 1970s to demonstrate that its results, under conditions, are remarkably like those obtained using the binomial model.
- For the period between 1999 and 2015, we found that this method has been applied to many cases and in many different fields, from the evaluation of construction projects ; investments in R&D , in particular those by pharmaceutical companies ; the evaluation of IT projects ; insurance portfolio

strategies; customer relationship management ; the management and evaluation of intangible assets ; and the assessment of bonds and derivatives .

- The real options model can also be used in portfolio selection and management, as well as in portfolio or project or asset assessment. Wang and Hwang applied the theory to the R&D portfolio decision, while Moore and Juh used daily data on warrants traded on the Johannesburg Stock Exchange between 1909 and 1922 to test how close derivative prices are to Black and Scholes' prices and to compute profits for investors using a simple trading rule for call options.
- Strategic decisions, such as entry to new markets, have at their core company-specific risks. The basic question is whether an investment or entry to a new area the potential of has helping a company protect its future earning streams from industry and macro-economic pressures reflected in market portfolio returns. Discounted cash flow techniques are standard methods used for the evaluation of capital budgeting projects. Under DCF, the expected cash inflows and outflows from a project are stated in present value terms by using a discount rate selected to account for the project's risk and the time value of money. The DCFs are summed, and investment costs are subtracted to obtain the net present value of the project. Theory holds that if the NPV is positive, the project should be undertaken to increase shareholder value.
- The assumption that all investments are irreversible is a fundamental weakness of most DCF methods. Managers often can influence the results of a project and have recourse to abandoning a project if results are poor, while retaining the opportunity of expanding projects if results are better than expected.

HIGHLY INFLUENTIAL ARTICLE

We used the following article as a basis of our evaluation:

Del Giudice, M., Evangelista, F., & Palmaccio, M. (2015). Defining the Black and Scholes approach: A first systematic literature review. Journal of Innovation and Entrepreneurship, 5(1), 1–13.

This is the link to the publisher's website:
https://innovation-entrepreneurship.springeropen.com/articles/10.1186/s13731-015-0030-8

INTRODUCTION

In an economic environment defined by great uncertainty, rapid change and the need for flexibility, it has become increasingly important for corporate managers and decision-makers to use investment assessment tools and processes that can give a correct representation of both uncertainty and the company's ability to react to new information.

In this scenario, real options (Adair et al. 2002; Bulan, 2005; Makhudu, 2011) have emerged as an approach that addresses this challenge more successfully than traditional capital budgeting techniques.

The real options analysis is so effective in the current business climate because of its explicit recognition process according to which future decisions designed to maximize value will depend on new information that will not be available or possible to obtain until after the initial investment has been made (Del Giudice et al., 2014; Dotsis et al., 2012; Fanklin & Diallo, 2012; Hult et al., 2010, Lankton & Luft, 2008).

It is in this sense, that real options recall financial options. If on one hand the value of a stock option, and the investor's decision to exercise ti, dependson the future stock price, on the other hands, the decision about whether to exercise a real option is based on the future value of an underlying real asset or on the future value of an investment project.

Several approaches have been developed over the years to calculate the real options value of an investment (Ashuri et al., 2012; Benaroch & Kauffman, 1999; Bulan et al., 2009; Denison et al., 2012; Kim et al., 2013, Krychowski & Quélin, 2010), a project (Benaroch & Kauffman, 1999; Brennan & Trigeorgis,

2000; Eschenbach et al., 2007; Kodukula & Papudesu, 2006; Mattar & Cheah, 2006) or of managing a customer relationship (Del Giudice et al., 2013 Burnetas & Ritchen; 2005; Henseler & Romer, 2013).

Among these methods, the Black and Scholes model is the most widely applied in many fields, not only for evaluating financial options.

In order to define a general framework of application and gain a better understanding of this financial evaluation method, its fields of application, the opportunities offered and the relative open issues, the aim of our paper is to formulate an updated conceptualization of the scientific contributions produced over the period between 1999 and 2015 related to business and economic perspectives.

The research methodology is of qualitative nature. The study proposes the scientific contribution of the last sixteen years researching four key words (Real Options Evaluation, Real Options Assessment, Black and Scholes, Real Options Pricing) in two databases (Google Scholar and EBSCO). In particular, the scientific contributions on the topic are searched, collected, and analyzed to propose the following literature review.

The structure of the paper is the following. After the "Background" section, the "Literature review" section contains the analyses of literature on real options assessment and real options evaluation. The "Results and discussion" section describes the research results. The "Conclusions" section illustrates the final consideration, the limitations, and future perspectives of the study. The "Methods" section includes the methodology used in the study.

CONCLUSION

The term "real options" was coined by Stewart Myers in 1977. It referred to applying option pricing theory to the valuation of non-financial or "real" investments with learning and flexibility, such as multi-stage R&D and modular manufacturing plant expansion (Myers, 1977). The topic attracted academic interest between 1980 and 1990, and articles on the theory and its applications were published.

Beginning in the mid-1990s, interest in the concepts of value and the techniques of valuation increased substantially. Real options began to attract considerable attention from industry as a potentially important tool for valuation and strategy.

Several practitioner books on the topic have appeared, and more are in progress. All things considered, real options have made the transition from a topic of modest academic interest to one that attracts considerable, active academic and industry attention.

A variety of contradictory approaches have been suggested for implementing real options in practice.

Real options in option-thinking are based on the same principles as financial options. In real options, the options involve "real" assets as opposed to financial ones. Having a "real option" means having the possibility, for a certain period, to choose either for or against making an investment decision, without binding oneself up front. For example, owning a power plant gives a utility company the chance, but not the obligation, to produce electricity at some later date.

Therefore, real options can be valued using the analogue option theories that have been developed for financial options, which are quite different from traditional DCF investment approaches.

The aim of the paper is to investigate the literature review on the real options model, through a quantitative study on the literature produced between 1999 and 2015 and an updated concept of the topic by classifying the contributions on the topic. The final objective of the analysis is to propose a new research perspective on the Black and Scholes method in economic and corporate perspectives.

As found in the analysis, the main topic of the contribution is the application of the real options model to evaluate assets, projects, and investments. This is followed by the use of the model for the following: decision-making purposes (42), portfolio selection and management (33), validation of real options theory (30), risk analysis (20) and criticizing the real options approach (4).

In this way, the paper provides quantitative data about the production of literature, by identifying the strong and weak points of the literature analyzed for the academic community.

According to the quantitative data, we can present the evolution of literary production during the period between 1999 and 2015. More specifically, we divided the contributions into the following categories: articles, books, and citations.

By analyzing the selected literature, it is possible to identify the main applications of this method within business administration, by offering new spaces to be filled with literary production.

The paper presents some limitations: it analyzed the literature production between 1999 and 2015 and then only the first six pages obtained from the two databases EBSCO and Google Scholar.

Future studies could be conducted to analyze a wider time and by applying the keywords to more databases.

APPENDIX

TABLE 1
GOOGLE SCHOLAR SEARCHING

Keywords	Total results retrieved from analysed database	Economic and corporate purposes	Available on the analysed database		Focus of the present study
			Total	Related to more keywords	
Real options valuation	60	39	9	5	21
Black and Scholes	60	15	4	0	
Real options assessment	60	17	3	3	
Real options pricing	60	38	15	9	
	240	109	31	17	

TABLE 2
EBSCO SEARCHING

Keywords	Total results retrieved from analysed database	Economic and corporate purposes	Available on the analysed database		Focus of the present study
			Total	Related to more keywords	
Real options valuation	120	48	33	7	84
Black and Scholes	120	20	14	0	
Real options assessment	120	41	16	6	
Real options pricing	120	45	30	3	
	480	154	93	16	

TABLE 3
FIRST RESEARCH RESULTS

Articles	Books	Citations	Chapters of book
147	10	5	1

TABLE 4
SECOND RESEARCH RESULTS

Research topics	Scientific contributions
Decision-making	42
Validation of real options theory	30
Criticize real options approach	4
Portfolio selection and management	33
Valuation of asset/project/investment	92
Analysis of the risk	20
	221

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TRANSLATED VERSION: SPANISH

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

VERSION TRADUCIDA: ESPAÑOL

A continuación se muestra una traducción aproximada de las ideas presentadas anteriormente. Esto se hizo para dar una comprensión general de las ideas presentadas en el documento. Por favor, disculpe cualquier error gramatical y no responsabilite a los autores originales de estos errores.

INTRODUCCIÓN

En un entorno económico definido por la gran incertidumbre, el rápido cambio y la necesidad de flexibilidad, se ha vuelto cada vez más importante para los gerentes corporativos y los responsables de la toma de decisiones utilizar herramientas y procesos de evaluación de inversiones que puedan dar una representación correcta de la incertidumbre y la capacidad de la empresa para reaccionar a la nueva información.

En este escenario, opciones reales (Adair et al. 2002; Bulan, 2005; Makhudu, 2011) han surgido como un enfoque que aborda este desafío con más éxito que las técnicas tradicionales de presupuestación de capital.

El análisis de opciones reales es tan eficaz en el clima de negocios actual debido a su proceso de reconocimiento explícito según el cual las decisiones futuras diseñadas para maximizar el valor dependerán de nueva información que no estará disponible o será posible obtener hasta después de que se haya realizado la inversión inicial (Del Giudice et al., 2014; Dotsis et al., 2012; Fanklin & Diallo, 2012; Hult et al., 2010, Lankton & Luft, 2008).

Es en este sentido, que las opciones reales recuerdan opciones financieras. Si por un lado el valor de una opción de acciones, y la decisión del inversor de ejercer ti, depende del precio futuro de las acciones, por otro lado, la decisión sobre si ejercer una opción real se basa en el valor futuro de un activo real subyacente o en el valor futuro de un proyecto de inversión.

A lo largo de los años se han desarrollado varios enfoques para calcular el valor real de las opciones de una inversión (Ashuri et al., 2012; Benaroch & Kauffman, 1999; Bulan et al., 2009; Denison et al., 2012; Kim et al., 2013, Krychowski & Quélin, 2010), un proyecto (Benaroch & Kauffman, 1999; Brennan & Trigeorgis, 2000; Eschenbach et al., 2007; Kodukula & Papudesu, 2006; Mattar & Cheah, 2006) o de gestionar una relación con el cliente (Del Giudice et al., 2013 Burnetas & Ritchen; 2005; Henseler & Romer, 2013).

Entre estos métodos, el modelo Black and Scholes es el más ampliamente aplicado en muchos campos, no sólo para evaluar las opciones financieras.

Con el fin de definir un marco general de aplicación y comprender mejor este método de evaluación financiera, sus campos de aplicación, las oportunidades ofrecidas y las cuestiones relativas abiertas, el objetivo de nuestro documento es formular una conceptualización actualizada de las contribuciones

científicas producidas durante el período comprendido entre 1999 y 2015 relacionadas con las perspectivas empresariales y económicas.

La metodología de investigación es de naturaleza cualitativa. El estudio propone la contribución científica de los últimos dieciséis años investigando cuatro palabras clave (Evaluación de Opciones Reales, Evaluación de Opciones Reales, Negro y Scholes, Precios de Opciones Reales) en dos bases de datos (Google Scholar y EBSCO). En particular, las contribuciones científicas sobre el tema se buscan, recopilan y analizan para proponer la siguiente revisión de la literatura.

La estructura del papel es la siguiente. Después de la sección "Fondo", la sección "Revisión de la literatura" contiene los análisis de la literatura sobre la evaluación de opciones reales y la evaluación de opciones reales. La sección "Resultados y discusión" describe los resultados de la investigación. La sección "Conclusiones" ilustra la consideración final, las limitaciones y las perspectivas futuras del estudio. La sección "Métodos" incluye la metodología utilizada en el estudio.

CONCLUSIÓN

El término "opciones reales" fue acuñado por Stewart Myers en 1977. Se refirió a la aplicación de la teoría de la fijación de precios de las opciones a la valoración de inversiones no financieras o "reales" con aprendizaje y flexibilidad, como la I+D multietapa y la expansión modular de las plantas de fabricación (Myers, 1977). El tema atrajo el interés académico entre 1980 y 1990, y se publicaron artículos sobre la teoría y sus aplicaciones.

A partir de mediados de la década de 1990, el interés por los conceptos de valor y las técnicas de valoración aumentó sustancialmente. Las opciones reales comenzaron a atraer una atención considerable de la industria como una herramienta potencialmente importante para la valoración y la estrategia.

Han aparecido varios libros de profesionales sobre el tema, y hay más en curso. Todas las cosas consideradas, las opciones reales han hecho la transición de un tema de modesto interés académico a uno que atrae una considerable atención académica activa y de la industria.

Se han sugerido diversos enfoques contradictorios para la aplicación de opciones reales en la práctica.

Las opciones reales en el pensamiento de opciones se basan en los mismos principios que las opciones financieras. En las opciones reales, las opciones implican activos "reales" en lugar de los financieros. Tener una "opción real" significa tener la posibilidad, durante un período determinado, de elegir a for o against to making a investment decision, without binding one up front. Por ejemplo, poseer una central eléctrica da a una empresa de servicios públicos la oportunidad, pero no la obligación, de producir electricidad en una fecha posterior.

Por lo tanto, las opciones reales se pueden valorar utilizando las teorías de opciones analógicas que se han desarrollado para las opciones financieras, que son muy diferentes de los enfoques de inversión tradicionales del DCF.

El objetivo del trabajo es investigar la revisión de la literatura sobre el modelo de opciones reales, a través de un estudio cuantitativo sobre la literatura producida entre 1999 y 2015 y un concepto actualizado del tema mediante la clasificación de las contribuciones sobre el tema. El objetivo final del análisis es proponer una nueva perspectiva de investigación sobre el método Black and Scholes en perspectivas económicas y corporativas.

Como se encuentra en el análisis, el tema principal de la contribución es la aplicación del modelo de opciones reales para evaluar activos, proyectos e inversiones. A esto le sigue el uso del modelo para lo siguiente: propósitos de toma de decisiones (42), selección y gestión de carteras (33), validación de la teoría de opciones reales (30), análisis de riesgos (20) y crítico del enfoque de opciones reales (4).

De esta manera, el documento proporciona datos cuantitativos sobre la producción de literatura, identificando los puntos fuertes y débiles de la literatura analizada para la comunidad académica.

Según los datos cuantitativos, podemos presentar la evolución de la producción literaria durante el período comprendido entre 1999 y 2015. Más específicamente, dividimos las contribuciones en las siguientes categorías: artículos, libros y citas.

Mediante el análisis de la literatura seleccionada, es posible identificar las principales aplicaciones de este método dentro de la administración de empresas, ofreciendo nuevos espacios a llenar de producción literaria.

El documento presenta algunas limitaciones: analizó la producción bibliográfica entre 1999 y 2015 y luego sólo las primeras seis páginas obtenidas de las dos bases de datos EBSCO y Google Scholar.

Se podrían realizar estudios futuros para analizar un tiempo más amplio y aplicando las palabras clave a más bases de datos.

TRANSLATED VERSION: FRENCH

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

VERSION TRADUITE: FRANÇAIS

Voici une traduction approximative des idées présentées ci-dessus. Cela a été fait pour donner une compréhension générale des idées présentées dans le document. Veuillez excuser toutes les erreurs grammaticales et ne pas tenir les auteurs originaux responsables de ces erreurs.

INTRODUCTION

Dans un environnement économique défini par une grande incertitude, des changements rapides et le besoin de flexibilité, il est devenu de plus en plus important pour les dirigeants d'entreprise et les décideurs d'utiliser des outils et des processus d'évaluation des investissements qui peuvent donner une représentation correcte de l'incertitude et de la capacité de l'entreprise à réagir aux nouvelles informations.

Dans ce scénario, des options réelles (Adair et coll. 2002 ; Bulan, 2005 ; Makhudu, 2011) sont apparus comme une approche qui relève ce défi avec plus de succès que les techniques traditionnelles de budgétisation des immobilisations.

L'analyse des options réelles est si efficace dans le climat actuel des affaires en raison de son processus explicite de reconnaissance selon lequel les décisions futures conçues pour maximiser la valeur dépendront de nouvelles informations qui ne seront pas disponibles ou possibles à obtenir avant la fin de l'investissement initial (Del Giudice et coll., 2014 ; Dotsis et coll., 2012 ; Fanklin et Diallo, 2012; Hult et coll., 2010, Lankton et Luft, 2008).

C'est en ce sens que les options réelles rappellent les options financières. Si, d'une part, la valeur d'une option d'achat d'actions et la décision de l'investisseur d'exercer ti dépendent du prix futur des actions, d'autre part, la décision d'exercer ou non une option réelle est fondée sur la valeur future d'un actif réel sous-jacent ou sur la valeur future d'un projet d'investissement.

Plusieurs approches ont été élaborées au fil des ans pour calculer la valeur réelle des options d'un investissement (Ashuri et coll., 2012; Benaroch et Kauffman, 1999; Bulan et coll., 2009; Denison et coll., 2012; Kim et coll., 2013, Krychowski et Quélin, 2010), un projet (Benaroch et Kauffman, 1999; Brennan et Trigeorgis, 2000; Eschenbach et coll., 2007; Kodukula et Papudesu, 2006; Mattar & Cheah, 2006) ou de la gestion d'une relation client (Del Giudice et coll., 2013 Burnetas & Ritchen; 2005; Henseler et Romer, 2013).

Parmi ces méthodes, le modèle Black and Scholes est le plus largement appliqué dans de nombreux domaines, et pas seulement pour l'évaluation des options financières.

Afin de définir un cadre général d'application et de mieux comprendre cette méthode d'évaluation financière, ses domaines d'application, les opportunités offertes et les questions relativement ouvertes, l'objectif de notre document est de formuler une conceptualisation actualisée des contributions scientifiques produites entre 1999 et 2015 en relation avec les perspectives commerciales et économiques.

La méthodologie de recherche est de nature qualitative. L'étude propose la contribution scientifique des seize dernières années à la recherche de quatre mots clés (Évaluation des options réelles, Évaluation des options réelles, Black and Scholes, Real Options Pricing) dans deux bases de données (Google Scholar et EBSCO). En particulier, les contributions scientifiques sur le sujet sont recherchées, recueillies et analysées pour proposer l'examen de la littérature suivant.

La structure du document est la suivante. Après la section « Contexte », la section « Examen de la littérature » contient les analyses de la documentation sur l'évaluation des options réelles et l'évaluation des options réelles. La section « Résultats et discussion » décrit les résultats de la recherche. La section « Conclusions » illustre l'examen final, les limites et les perspectives futures de l'étude. La section « Méthodes » comprend la méthodologie utilisée dans l'étude.

CONCLUSION

Le terme « options réelles » a été inventé par Stewart Myers en 1977. Il a fait référence à l'application de la théorie de la tarification des options à l'évaluation d'investissements non financiers ou « réels » avec apprentissage et souplesse, comme la R-D à plusieurs étapes et l'expansion modulaire de l'usine de fabrication (Myers, 1977). Le sujet a suscité l'intérêt des universitaires entre 1980 et 1990, et des articles sur la théorie et ses applications ont été publiés.

À partir du milieu des années 1990, l'intérêt pour les concepts de valeur et les techniques d'évaluation a considérablement augmenté. Les options réelles ont commencé à attirer l'attention considérable de l'industrie en tant qu'outil potentiellement important pour l'évaluation et la stratégie.

Plusieurs livres de praticiens sur le sujet sont paru, et d'autres sont en cours. Tout bien considéré, les options réelles ont fait la transition d'un sujet d'intérêt académique modeste à un sujet qui attire une attention académique et de l'industrie considérable et active.

Diverses approches contradictoires ont été proposées pour mettre en œuvre des options réelles dans la pratique.

Les options réelles dans la réflexion sur les options sont basées sur les mêmes principes que les options financières. Dans les options réelles, les options impliquent des actifs « réels » plutôt que financiers. Avoir une « vraie option » signifie avoir la possibilité, pendant un certain temps, de choisir pour ou contre une décision d'investissement, sans se lier d'avance. Par exemple, posséder une centrale donne à une entreprise de services publics la possibilité, mais non l'obligation, de produire de l'électricité à une date ultérieure.

Par conséquent, les options réelles peuvent être évaluées en utilisant les théories d'options analogiques qui ont été développées pour les options financières, qui sont très différentes des approches traditionnelles d'investissement DCF.

L'objectif de l'article est d'étudier l'examen de la littérature sur le modèle des options réelles, à travers une étude quantitative sur la littérature produite entre 1999 et 2015 et un concept mis à jour du sujet en classant les contributions sur le sujet. L'objectif final de l'analyse est de proposer une nouvelle perspective de recherche sur la méthode Black and Scholes dans les perspectives économiques et corporatives.

Comme on le trouve dans l'analyse, le principal sujet de la contribution est l'application du modèle d'options réelles pour évaluer les actifs, les projets et les investissements. Elle est suivie de l'utilisation du modèle pour les éléments suivants : prise de décision (42), sélection et gestion de portefeuille (33), validation de la théorie des options réelles (30), analyse des risques (20) et critique de l'approche des options réelles (4).

De cette façon, l'article fournit des données quantitatives sur la production de la littérature, en identifiant les points forts et faibles de la littérature analysée pour la communauté universitaire.

Selon les données quantitatives, nous pouvons présenter l'évolution de la production littéraire entre 1999 et 2015. Plus précisément, nous avons divisé les contributions en catégories suivantes : articles, livres et citations.

En analysant la littérature sélectionnée, il est possible d'identifier les principales applications de cette méthode au sein de l'administration des entreprises, en offrant de nouveaux espaces à remplir de production littéraire.

L’article présente quelques limites : il a analysé la production littéraire entre 1999 et 2015, puis seulement les six premières pages obtenues à partir des deux bases de données EBSCO et Google Scholar.

Des études futures pourraient être menées pour analyser un temps plus large et en appliquant les mots clés à plus de bases de données.

TRANSLATED VERSION: GERMAN

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

ÜBERSETZTE VERSION: DEUTSCH

Hier ist eine ungefähre Übersetzung der oben vorgestellten Ideen. Dies wurde getan, um ein allgemeines Verständnis der in dem Dokument vorgestellten Ideen zu vermitteln. Bitte entschuldigen Sie alle grammatikalischen Fehler und machen Sie die ursprünglichen Autoren nicht für diese Fehler verantwortlich.

EINLEITUNG

In einem wirtschaftlichen Umfeld, das von großer Unsicherheit, raschem Wandel und dem Bedürfnis nach Flexibilität geprägt ist, ist es für Unternehmensmanager und Entscheidungsträger immer wichtiger geworden, Instrumente und Prozesse zur Bewertung von Investitionen zu nutzen, die sowohl Unsicherheit als auch die Fähigkeit des Unternehmens, auf neue Informationen zu reagieren, korrekt darstellen können.

In diesem Szenario, reale Optionen (Adair et al. 2002; Bulan, 2005; Makhudu, 2011) hat sich als ein Ansatz herauskristallisiert, der diese Herausforderung erfolgreicher angeht als herkömmliche Kapitalbudgetierungstechniken.

Die Analyse der realen Optionen ist im aktuellen Geschäftsklima aufgrund ihres expliziten Anerkennungsprozesses so effektiv, dass zukünftige Entscheidungen zur Maximierung des Wertes von neuen Informationen abhängen, die erst nach der Erstinvestition verfügbar oder zu erhalten sein werden (Del Giudice et al., 2014; Dotsis et al., 2012; Fanklin & Diallo, 2012; Hult et al., 2010, Lankton & Luft, 2008).

In diesem Sinne erinnern reale Optionen an finanzielle Optionen. Wenn einerseits der Wert einer Aktienoption und die Entscheidung des Anlegers, ti auszuüben, vom zukünftigen Aktienkurs abhängt, hängt die Entscheidung darüber, ob eine reale Option ausgeübt werden soll, auf dem zukünftigen Wert eines zugrunde liegenden Realvermögens oder auf dem zukünftigen Wert eines Anlageprojekts ab.

Im Laufe der Jahre wurden mehrere Ansätze entwickelt, um den realen Optionswert einer Investition zu berechnen (Ashuri et al., 2012; Benaroch & Kauffman, 1999; Bulan et al., 2009; Denison et al., 2012; Kim et al., 2013, Krychowski & Quélin, 2010), ein Projekt (Benaroch & Kauffman, 1999; Brennan & Trigeorgis, 2000; Eschenbach et al., 2007; Kodukula & Papudesu, 2006; Mattar & Cheah, 2006) oder der Verwaltung einer Kundenbeziehung (Del Giudice et al., 2013 Burnetas & Ritchen; 2005; Henseler & Romer, 2013).

Unter diesen Methoden ist das Black and Scholes-Modell das am weitesten verbreitete in vielen Bereichen, nicht nur für die Bewertung finanzieller Optionen.

Um einen allgemeinen Anwendungsrahmen zu definieren und ein besseres Verständnis dieser Methode der finanziellen Bewertung, ihrer Anwendungsbereiche, der gebotenen Möglichkeiten und der relativ offenen Fragen zu erlangen, ist es das Ziel unseres Papiers, eine aktualisierte Konzeptualisierung der wissenschaftlichen Beiträge zu formulieren, die im Zeitraum zwischen 1999 und 2015 im Zusammenhang mit den geschäfts- und wirtschaftlichen Perspektiven erstellt wurden.

Die Forschungsmethodik ist qualitativer Natur. Die Studie schlägt den wissenschaftlichen Beitrag der letzten sechzehn Jahre bei der Erforschung von vier Schlüsselwörtern (Real Options Evaluation, Real

Options Assessment, Black and Scholes, Real Options Pricing) in zwei Datenbanken (Google Scholar und EBSCO) vor. Insbesondere werden die wissenschaftlichen Beiträge zu diesem Thema durchsucht, gesammelt und analysiert, um die folgende Literaturrezension vorzuschlagen.

Die Struktur des Papiers ist die folgende. Nach dem Abschnitt "Hintergrund" enthält der Abschnitt "Literaturrezension" die Analysen der Literatur zur Bewertung realer Optionen und zur Bewertung realer Optionen. Der Abschnitt "Ergebnisse und Diskussion" beschreibt die Forschungsergebnisse. Der Abschnitt "Schlussfolgerungen" veranschaulicht die abschließende Betrachtung, die Grenzen und die Zukunftsperspektiven der Studie. Der Abschnitt "Methoden" enthält die in der Studie verwendete Methodik.

SCHLUSSFOLGERUNG

Der Begriff "echte Optionen" wurde 1977 von Stewart Myers geprägt. Er bezog sich auf die Anwendung der Optionspreistheorie auf die Bewertung nichtfinanzieller oder "realer" Investitionen mit Lern- und Flexibilitätsflexibilität, wie z. B. Mehrstufige F&E und modulare Produktionsanlagenerweiterung (Myers, 1977). Das Thema erregte zwischen 1980 und 1990 akademisches Interesse, und Artikel über die Theorie und ihre Anwendungen wurden veröffentlicht.

Ab Mitte der 1990er Jahre nahm das Interesse an den Wertkonzepten und den Bewertungstechniken deutlich zu. Reale Optionen begannen, erhebliche Aufmerksamkeit aus der Industrie als potenziell wichtiges Instrument für Bewertung und Strategie zu gewinnen.

Mehrere Praktiker-Bücher zu diesem Thema sind erschienen, und weitere sind in Arbeit. Alles in allem haben echte Optionen den Übergang von einem Thema von bescheidenem akademischem Interesse zu einem Thema vollzogen, das beträchtliche, aktive akademische und branchenweite Aufmerksamkeit erregt.

Es wurden eine Vielzahl widersprüchlicher Ansätze zur Umsetzung realer Optionen in der Praxis vorgeschlagen.

Reale Optionen im Optionsdenken basieren auf den gleichen Prinzipien wie Finanzoptionen. Bei realen Optionen handelt es sich bei den Optionen um "reale" Vermögenswerte im Gegensatz zu finanziellen. Eine "echte Option" zu haben bedeutet, für einen bestimmten Zeitraum die Möglichkeit zu haben, entweder für oder gegen eine Anlageentscheidung zu entscheiden, ohne sich im Voraus zu binden. Zum Beispiel gibt der Besitz eines Kraftwerks einem Versorgungsunternehmen die Möglichkeit, aber nicht die Verpflichtung, zu einem späteren Zeitpunkt Strom zu erzeugen.

Daher können reale Optionen mit den analogen Optionstheorien bewertet werden, die für Finanzoptionen entwickelt wurden, die sich ganz von herkömmlichen DCF-Investitionsansätzen unterscheiden.

Ziel des Papiers ist es, die Literaturrecherche zum Realen Optionsmodell durch eine quantitative Studie über die zwischen 1999 und 2015 erstellte Literatur und ein aktualisiertes Konzept des Themas durch Klassifizierung der Beiträge zum Thema zu untersuchen. Das Endziel der Analyse ist es, eine neue Forschungsperspektive zur Schwarz-Scholes-Methode in wirtschaftlicher und unternehmerischer Hinsicht vorzuschlagen.

Wie in der Analyse festgestellt, ist das Hauptthema des Beitrags die Anwendung des Real Optionsmodells zur Bewertung von Vermögenswerten, Projekten und Investitionen. Es folgt die Verwendung des Modells für folgende Zwecke: Entscheidungszwecke (42), Portfolioauswahl und -management (33), Validierung der Theorie der realen Optionen (30), Risikoanalyse (20) und Kritik am Ansatz der realen Optionen (4).

Auf diese Weise liefert das Papier quantitative Daten über die Produktion von Literatur, indem es die Stärken und Schwächen der für die akademische Gemeinschaft analysierten Literatur identifiziert.

Nach den quantitativen Daten können wir die Entwicklung der literarischen Produktion im Zeitraum zwischen 1999 und 2015 darstellen. Genauer gesagt haben wir die Beiträge in die folgenden Kategorien eingeteilt: Artikel, Bücher und Zitate.

Durch die Analyse der ausgewählten Literatur ist es möglich, die Hauptanwendungen dieser Methode innerhalb der Betriebswirtschaftslehre zu identifizieren, indem neue Räume mit literarischer Produktion gefüllt werden.

Das Papier weist einige Einschränkungen auf: Es analysierte die Literaturproduktion zwischen 1999 und 2015 und dann nur die ersten sechs Seiten aus den beiden Datenbanken EBSCO und Google Scholar.

Zukünftige Studien könnten durchgeführt werden, um eine größere Zeit zu analysieren und die Schlüsselwörter auf mehr Datenbanken anzuwenden.

TRANSLATED VERSION: PORTUGUESE

Below is a rough translation of the insights presented above. This was done to give a general understanding of the ideas presented in the paper. Please excuse any grammatical mistakes and do not hold the original authors responsible for these mistakes.

VERSÃO TRADUZIDA: PORTUGUÊS

Aqui está uma tradução aproximada das ideias acima apresentadas. Isto foi feito para dar uma compreensão geral das ideias apresentadas no documento. Por favor, desculpe todos os erros gramaticais e não responsacule os autores originais responsáveis por estes erros.

INTRODUÇÃO

Em um ambiente econômico definido por grande incerteza, mudança rápida e necessidade de flexibilidade, tornou-se cada vez mais importante para gestores corporativos e tomadores de decisão usarem ferramentas e processos de avaliação de investimentos que possam dar uma representação correta tanto da incerteza quanto da capacidade da empresa de reagir a novas informações.

Nesse cenário, opções reais (Adair et al. 2002; Bulan, 2005; Makhudu, 2011) emergiu como uma abordagem que aborda esse desafio com mais sucesso do que as técnicas tradicionais de orçamento de capital.

A análise real de opções é tão eficaz no atual clima de negócios devido ao seu processo de reconhecimento explícito de acordo com o qual decisões futuras projetadas para maximizar o valor dependerão de novas informações que não estarão disponíveis ou possíveis de obter até que o investimento inicial tenha sido feito (Del Giudice et al., 2014; Dotsis et al., 2012; Fanklin & Diallo, 2012; Hult et al., 2010, Lankton & Luft, 2008).

É nesse sentido, que opções reais lembram opções financeiras. Se, por um lado, o valor de uma opção de ação, e a decisão do investidor de exercer ti, dependem do preço futuro das ações, por outro, a decisão sobre exercer uma opção real é baseada no valor futuro de um ativo real subjacente ou no valor futuro de um projeto de investimento.

Várias abordagens foram desenvolvidas ao longo dos anos para calcular o valor real das opções de um investimento (Ashuri et al., 2012; Benaroch & Kauffman, 1999; Bulan et al., 2009; Denison et al., 2012; Kim et al., 2013, Krychowski & Quélin, 2010), um projeto (Benaroch & Kauffman, 1999; Brennan & Trigeorgis, 2000; Eschenbach et al., 2007; Kodukula & Papudesu, 2006; Mattar & Cheah, 2006) ou de gerenciar um relacionamento com o cliente (Del Giudice et al., 2013 Burnetas & Ritchen; 2005; Henseler & Romer, 2013).

Entre esses métodos, o modelo Preto e Scholes é o mais aplicado em muitas áreas, não apenas para avaliar opções financeiras.

Para definir um quadro geral de aplicação e obter uma melhor compreensão desse método de avaliação financeira, seus campos de aplicação, as oportunidades oferecidas e as questões relativas abertas, o objetivo do nosso artigo é formular uma conceituação atualizada das contribuições científicas produzidas ao longo do período entre 1999 e 2015 relacionadas às perspectivas empresariais e econômicas.

A metodologia de pesquisa é de natureza qualitativa. O estudo propõe a contribuição científica dos últimos dezesseis anos pesquisando quatro palavras-chave (Avaliação de Opções Reais, Avaliação de Opções Reais, Preto e Scholes, Preços de Opções Reais) em duas bases de dados (Google Scholar e EBSCO). Em particular, as contribuições científicas sobre o tema são pesquisadas, coletadas e analisadas para propor a seguinte revisão biblio literatura.

A estrutura do papel é a seguinte. Após a seção "Fundo", a seção "Revisão de Literatura" contém as análises da literatura sobre avaliação de opções reais e avaliação de opções reais. A seção "Resultados e discussão" descreve os resultados da pesquisa. A seção "Conclusões" ilustra a consideração final, as limitações e as perspectivas futuras do estudo. A seção "Métodos" inclui a metodologia utilizada no estudo.

CONCLUSÃO

O termo "opções reais" foi cunhado por Stewart Myers em 1977. Referia-se à aplicação da teoria dos preços das opções à valorização de investimentos não financeiros ou "reais" com aprendizado e flexibilidade, como p&D multi estágio e expansão de fábricas modulares (Myers, 1977). O tema atraiu interesse acadêmico entre 1980 e 1990, e artigos sobre a teoria e suas aplicações foram publicados.

A partir de meados da década de 1990, o interesse pelos conceitos de valor e pelas técnicas de valorização aumentou substancialmente. As opções reais começaram a atrair considerável atenção da indústria como uma ferramenta potencialmente importante para a valorização e estratégia.

Vários livros de praticantes sobre o tema apareceram, e mais estão em andamento. Considerando tudo, opções reais fizeram a transição de um tema de modesto interesse acadêmico para um que atrai considerável, atenção acadêmica ativa e da indústria.

Uma variedade de abordagens contraditórias foram sugeridas para implementar opções reais na prática.

Opções reais no pensamento de opções são baseadas nos mesmos princípios das opções financeiras. Em opções reais, as opções envolvem ativos "reais" em oposição aos financeiros. Ter uma "opção real" significa ter a possibilidade, por um determinado período, de escolher a favor ou contra a tomada de uma decisão de investimento, sem se vincular à frente. Por exemplo, possuir uma usina dá a uma concessionária a chance, mas não a obrigação, de produzir eletricidade em alguma data posterior.

Portanto, opções reais podem ser valorizadas usando as teorias de opções analógicas que foram desenvolvidas para opções financeiras, que são bem diferentes das abordagens tradicionais de investimento do DCF.

O objetivo do artigo é investigar a revisão da literatura sobre o modelo de opções reais, por meio de um estudo quantitativo sobre a literatura produzida entre 1999 e 2015 e um conceito atualizado do tema, classificando as contribuições sobre o tema. O objetivo final da análise é propor uma nova perspectiva de pesquisa sobre o método Preto e Scholes nas perspectivas econômicas e corporativas.

Conforme encontrado na análise, o principal tema da contribuição é a aplicação do modelo de opções reais para avaliar ativos, projetos e investimentos. Segue-se o uso do modelo para os seguintes propósitos: fins de tomada de decisão (42), seleção e gestão de carteira (33), validação da teoria das opções reais (30), análise de risco (20) e criticar a abordagem real de opções (4).

Dessa forma, o artigo fornece dados quantitativos sobre a produção da literatura, identificando os pontos fortes e fracos da literatura analisada para a comunidade acadêmica.

De acordo com os dados quantitativos, podemos apresentar a evolução da produção literária no período entre 1999 e 2015. Mais especificamente, dividimos as contribuições nas seguintes categorias: artigos, livros e citações.

Analisando a literatura selecionada, é possível identificar as principais aplicações desse método dentro da administração empresarial, oferecendo novos espaços a serem preenchidos com produção literária.

O artigo apresenta algumas limitações: analisou a produção literária entre 1999 e 2015 e, em seguida, apenas as seis primeiras páginas obtidas nas duas bases de dados EBSCO e Google Scholar.

Estudos futuros poderiam ser realizados para analisar um tempo mais amplo e aplicando as palavras-chave em mais bancos de dados.