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## Social media and capital markets. An overview.

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### Abstract

A growing body of research and practical applications employ social media data as a proxy for complex behavior of a society. This paper provides an overview of academic research related to link between the social media and capital markets. Its theoretical rationale is predominantly defined by behavioral finance. Behavioral finance augments standard model of efficient markets and considers less rational factors like investors' sentiment or public mood as influential for asset pricing or capital market volatility. In this context, social media is a novel tool which enables to collect the data about such less rational factors at the level of a society. The paper introduces social media data from technical and economic point of view. Further, it contributes to the theoretical construction of the transmission mechanism between social media and capital markets currently missing in the literature. Subsequently, the paper summarizes the main findings in this field and outline its future prospects.

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### 1. Introduction

Social media can be classed without dispute among the current phenomena in our society. Social media connects people from all over the world into one virtual community. The main goal of social media is the ability to accomplish an easier communication and content sharing. However, for the purpose of this paper another and any less fact is relevant. Social media is a great database of society's behavior. Data provided by social media, so called "big data", are becoming very popular and many practical applications as well as academic research have been accomplished in this field. The goal is clear, to better understand the behavior of a society.

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The purpose of this paper is an overview of the current state of the art in the research related to employment of social media big data in the field of capital markets. The main focus is to provide the inclusion in this growing research, summarize main findings and outline the future evolution of this field. The contribution of the paper is the theoretical proposal of the transmission mechanism from social networks to capital markets. Despite the growing research, there has been no clear definition of this relationship yet. The rest of the paper is structured as follows. The next section provides the reader with an understanding of social media, its forms and functioning. Further, it describes the basic definition of big data. These two chapters are quite technical, but very important if one would like to understand the challenges in the collection of data about society's behavior via social media. The third section presents the link between social media and capital markets from an economic point of view in the form of the transmission mechanism. The fourth section summarizes the contributions and findings of several important papers. Last section concludes and proposes the potential prospects of the further research.

## **2. Understanding of social media**

From a technical point of view, social media are web-based or mobile technologies necessary for operating of highly interactive platforms where users create, modify and share user-generated content (Kietzmann et al., 2011). Boyd & Ellison (2008) use instead of the term "social media" the term "social network site" and characterize it also as a web-based services which allow for users to create public or semi-public profile and create a tree of connections with other users. Kaplan & Haenlein (2010) describe social media as internet-based applications that incorporate the ideas and technology of previous web structure like Web 2.0 but allow for individual users in the creation and exchange of web content.

Social media has evolved into many forms. Kaplan & Haenlein (2010) provide the classification scheme to sort social media in the systematic manner. However, for the purpose of this paper, this deeper classification is not relevant because the research related to capital markets uses predominantly the data from social media Facebook and Twitter. The choice of these two social media is most likely related to practical reasons like data availability, number of users or high popularity in the western world, because current research in this field examines US or advanced European capital markets. Deeper understanding of the social media functioning is provided in the paper of Kietzmann et al. (2011) who constructed a framework of seven social media building blocks. This framework describes the social media environment and social media audience in detail. For the purpose of this paper, building blocks "Sharing" and "Conversations" are the most important because they are the source of "big data". In other words, social media users lead conversations in many forms like Facebook "comments" or Twitter "tweets" and they are able to share them with others. Such a data can be collected and further analyzed. However, these two blocks are results of other blocks, in particular "Presence", "Identity", "Groups", "Relationships" and "Reputation". Their functionalities and explanation are shown in Kietzman et al. (2011).

The big data provided by social media are not the only source of data employed in the analysis related to capital markets. Several papers presented below employ data from search engine Google. To be specific, Google provides data about the volume of searches for given phrase so called Google queries. These search queries are considered in this paper also as a big data because its provide the insight about the interest of a society in the searched topic. From a technical point of view, the Google search engine is not a standard social media like Twitter and Facebook, but from a practical point of view this discrepancy is not relevant for the purpose of this paper. In general, Google provides data about society's behavior as well as the Twitter or Facebook.

### *2.1. Big data*

Previous part introduces the definition of social media and search engine Google as a sources of big data related to applications on capital markets. However, big data require characterization of its own. Halevi & Moed (2012) defines big data as the large sets of data which cannot be processed by traditional management tools due to their size and complexity. Big data are high-volume, high-velocity and high-variety information that requires cost-effective and innovative approach to processing of data which release the opportunity for enhanced insight, decision making and process automation (Beyer & Laney, 2012; Gartner, 2015). The previous definitions need to be augmented in the line with the idea of this paper. To be specific, big data are large data sets related to the behavior of individuals and society.

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