

Behavioural Economy Perspective on Decision-Making of the Location of the Company

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Abstract. The paper brings insights on business localization mainly from descriptive theories, which, in contrast to the ideal state, study the reasoning of decision makers as human beings. These are inherently fallible and subject to a large variety of factors that normative theories are not yet able to encompass. The article builds on previous work, published under the title Deciding on the location of the company, where the authors describe classical theories while also placing the topic in the context of behavioral economics research. This paper takes a behavioral science perspective only and discusses in more detail selected behavioral theories and their potential contributions to the understanding of firm location decision-making processes.

Keywords: behavioural economy, decision-making, location

JEL classification: E70, E71

1 Introduction

Behavioral theory of firm location is a relatively young branch of the study of behavioral economics. Traditional economists often view behavioral economics as a contrast and critique of traditional theories. However, our work is not intended to replace normative models. We aim to enrich classical economic theory with new insights, to contribute to the development of economic and management science, and to stimulate out-of-the-box thinking by researchers in these fields. We will not mention classical theories of localization in our text, as they have been and are the subject of research by many from the academic community, and we provide an overview of them in our previous work, which we refer to in the text. Our work is concerned with how business

owners actually choose locations for their businesses. Publications that take into account the behavioral aspect and use a descriptive approach are still not enough in this area and therefore our paper is mainly theoretical in nature. Using inference, based on empirically acquired insights from behavioral economics, we show how these insights can contribute to shedding light on the decision-making process of where business owners actually locate their businesses.

2 The Place of Behavioral Economics in the Theory of Enterprise Localization

At present, companies use mostly prescriptive approaches to business location or at least strive to do so. This is an approach based on classical or non-classical economic theory. But decision-making is not a computer-driven process. It is not based only on the visible, the tangible and the quantifiable. In the past, authors have seen the problem of location from different perspectives such as location, organizational zoning or from the perspective of the passage of time (Table 1). Ketokivi et al. adds a behavioral economics perspective to the perspectives of authors from the last century and calls this perspective a decision perspective (Ketokivi et al. 2017). Bringing psychology and economics together, newer concepts of decision theory are emerging that describe and explain the decision-making process in real-world terms. Descriptive directions in decision making, as part of behavioral economics, describe how the decision-making process actually takes place in real-world conditions. They can also be used by analogy in the study of the decision problem of business location.

The fundamental shift of behavioural theories from classical economics is the different understanding of rationality and irrationality (Friedman et al. 2004). The decision to locate, regardless of the quantity and quality of the methods used, their accuracy, complexity, simplicity or complexity, is ultimately made by humans. The first three perspectives described above are academic paradigms that focus on how scientists think about location decisions. But how do managers think about it. Do managers really analyze and evaluate location factors? Which factors are considered? How many at a time? Ketokivi (2017) expressed 4 concerns when using classical approaches.

Many empirical research articles assume that managers consider locational factors to be perfectly rational and are able to examine their importance either one by one or by contrasting them. Brush et al. for example, asked managers to explain the extent to which a given factor (e.g., tax considerations) influenced the location decision (Brush et al. 1999). When asking questions such as "How important are tax considerations in location decisions?" The question itself guides the authors to address it by considering some type of cost, and this can be misleading if the goal is to understand the decision itself. Much of the research on location does not really address decisions, but rather the general factors that lead to them.

Another problem relates to the level of analysis. How much information about location decision making can be obtained at a general, abstract level that ignores the micro-level context? A single firm can make hundreds of different location decisions for

hundreds of different products (Gray et al. 2013). Therefore, in order to understand the positioning decision, it would be necessary to examine the positioning decision for a specific product, and whatever factors are examined should be examined in the context of that specific product.

A third concern is the application of econometric techniques. The standard practice of formulating an econometric regression model forces the researcher to model the effects of exogenous variables independently or through simple (linear) interactions. But in authentic decision situations, it is almost certain that the interactions are much more complicated than the models are capable of capturing. Perhaps in one case, one factor (e.g., tax laws) wins out over the others; in another case, several factors may have a joint effect (e.g., proximity to markets and access to skilled labor); in yet another case, one factor pulls in one direction, but two others pull in opposite directions (e.g., a region may offer cheap labor, but the distance to markets is great). The literature on localization rarely addresses such trade-offs, tensions, and conflicts.

The fourth concern is that we are working with premises rather than facts. If the goal is to understand authentic decisions, we must take into account the fact that decisions are made by boundedly rational agents who base decisions on "factual assumptions" (i.e., beliefs) rather than facts (Simon 1997). The difference is fundamental.

The importance of the knowledge of behavioural economics and descriptive approaches to decision-making is precisely that their knowledge allows decision-makers to avoid "irrational decisions", to understand that even competitors may not behave rationally and to approach a more accurate picture of the economic reality in which managers act. The most important empirically acquired insights from behavioural economics that are directly relevant to the decision to locate a business are presented in the Results of the work section

Table 1- Perspectives on the investigation of enterprise localization

Perspec- tive	Focus	Keywords and con- cepts	Theoretical foundations and empirical research
Location	Site-specific factors. For example, labour costs and tax incentives.	Agglomeration economies; comparative advantages; factors of production; locational pulls	Badri et al, 1995 , Belderbos and Sleuwaegen, 2005 , Bhatnagar et al, 2003 , Brush et al, 1999 , Ellram et al, 2013 , Feldmann and Olhager, 2013 , MacCarthy and Athirawong, 2003 , Yoshida, 1987
Organisa- tion	The internal structure of the firm and the roles that different functional units have in the company's organisational network.	differentiation; factory networks; firm-level factors; integration; organization of interdependencies; organizational roles	Ferdows, 1989 , Ghoshal and Nohria, 1989 , Howells, 1990 , Khurana and Talbot, 1998 , Maritan et al., 2004 , Rugman and Verbeke, 2001 , Schmenner, 1982b , Vereecke and Van Dierdonck, 2002 , Vereecke et al., 2006
Time	The impact of location decisions on key company processes such as purchasing and delivery. Time is an essential parameter	turnaround speed; lead time; quick response production; time-based competition	Blackburn, 2012 , Contreras et al., 2012 , de Treville et al., 2014 , Ferdows et al., 2004 , Fine, 1998 , Fine, 2000 , Holweg et al., 2011 , Suri, 1998 , Stalk, 1988
Decision making	Understanding the actual decision, empirical consistency, does not give preference to any theoretical approach.	bounded rationality; decision making; information processing; decision making	Bromiley, 1986 , Cyert and March, 1992 , Dean and Sharfman, 1993 , Marucheck and kol., 1990 , Menda and Dilts, 1997 , Mills et al., 1998 , Simon, 1997

Source: own processing according to (Ketokivi et al. 2017)

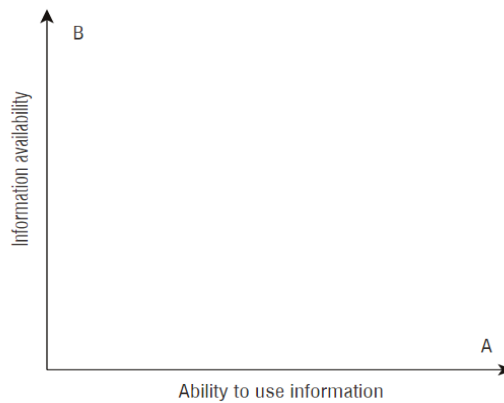
3 Results of the work

Amos Tversky began to work on behavioral decision theory issues as early as 1948. Tversky used experiments to show that people estimate right-probabilities differently from the way expected utility theory describes them. Together with D. Kahneman, they began to investigate some phenomena in agents' decision making such as anchoring, availability, and overconfidence. Building on Simon's unspecified findings that people may use so-called heuristics that represent unification of a decision in a complicated situation (Simon and Newell 1958), Tversky and Kahneman successively detailed in their papers common heuristic reasoning procedures and the deviations from rationality that were associated with these heuristics (Tversky and Kahneman 1974). The publication of research on systematic deviations from elicited a response from scholars in economics and management. Several authors have incorporated these findings into theories of firm localization.

3.1 Pred matrix

The theory of bounded rationality was later used by A. Pred (Pred 1967). The behavioral matrix he formulated linked the availability of information, the investor's ability to process information, and the "profitability" of the chosen business location. The general rule is that the more information (or information processing ability) a decision maker has, the more profitable the location one chooses, *caeteris paribus*. A modified version of the Prior Matrix is shown in Figure 1. Point A represents homo economicus, who has perfect information and perfect ability to use it to choose the optimal location solution. All other decision makers make suboptimal decisions, and the *ex-tribe* is at point B, where the producer has little information and poor ability to process it, so he chooses a bad location that may result in a loss.

Figure 1 - Pred matrix



Source: PRED, Allan, 1967. Behavior and localization, foundations of geographical and dynamic localization theory. Part I, 1967.1.2
Perception of space

Even a few years before A. Pred, D. Lowenthal (1961) argued that everyone has their own personal geography, which can be considered as a picture of the world, dependent on where they live, their previous experiences and knowledge (Lowenthal 1961). One can know almost nothing about distant places and at the same time know much more information about one's local area than can be ascertained from available sources. In 1960 K. Lynch published a book, *Image of the city*, in which he discussed how people remember and perceive elements of urban space. He asked participants in a research study to draw a map of the city in which they lived and found that different people's maps of the same cities varied in terms of the level of detail and objects captured. When he combined the maps together he got a picture of the city as people perceived it. Lynch argues that space is perceived by all the senses at the same time and these perceptions store fragments in the memory that later when we need to recall a place portray the space subjectively (Lynch 1960). Lynch's findings and mental maps offer new insight into the issue of business location. The mental map incorporates the emotion of the place. For example, a mental map of a particular location could greatly help retailers to attract customers and increase in-store traffic due to the location of the store.

3.2 Mental maps

P. Gould's 1966 work can be considered as a superstructure of Lynch's mental maps (Gould 1966). The title of his work *On mental maps* is slightly misleading, since it is more about preference maps. Gould investigated the influence of spatial perception on spatial decisions and found that many of the decisions people make are related to the way they perceive the space around them and from different evaluations of some parts of it.

3.3 Heuristics in localization

We have already suggested that people "facilitate" their decision-making with certain shortcuts - heuristics. In this subsection we will outline in more detail, using inference, how these shortcuts can influence localization decisions.

Representational heuristics are related to the equation of similarity with truth-probability by humans. According to this heuristic, humans believe that the probability that an object from category A belongs to category B is greater the more similar A is to B (Kahneman et al. 1982). Determining probability in disambiguation processes requires more than appealing to similarity and involves performing complex operations. Humans may be subject to these heuristics when making localization decisions, and are likely to do so. People may judge the suitability of a particular locale for a business by the density of other businesses in or around that locale. On the other hand, these heuristics could lead to the exclusion of initially considered locations due to a stereotype referring to the class to which they belong, such as a neighborhood or city considered

polluted, unfriendly, expensive, or otherwise. In both examples, the failure to refer to evidence in the form of data, including statistics and facts, is neglected in the decision-making process (Sabat and Pile-wicz 2019).

The availability heuristic is another decision-making shortcut whose influence on the decision to locate a business can be deduced quite easily. This shorthand in judgment is related to a person's assessment of the frequency and probability of certain phenomena through the ease with which circumstances or examples appear in one's mind to which one can refer when making a decision (Kahneman 2003). According to the availability heuristic, inference is based on the psychological availability and ease of use of decision patterns that have occurred more frequently. As a result, relying on the availability of examples that already exist in a person's mind leads to biased decisional consequences of these heuristics in the choice of the location of a venture (Sabat and Pilewicz 2019). This may relate to locations that the individual making the decision knows well through other experiences, such as place of birth, place of residence, or place of work, and satisfaction with the decision that leads to the choice of a well-known location. Thus, he may prefer a location to which he simply has more emotions attached or about which he has more information, despite its inappropriateness, rather than objectively assessing all options on the basis of the same objective factors.

The anchoring heuristic introduces the notion of a reference point that an individual learned first during a previous decision process. As a result of these heuristics, the final outcome of the decision-making process adapts to the values or reference-points that were considered in the first steps of the decision-making process, often with incomplete information (Kahneman 2003). Reference-points influence the quality of the decisions made. If they consist of hearsay, informal information or are not based on thorough analyses, they negatively affect the final decisions. In business location decision making, these heuristics are concerned with anchoring the process of inference on unconfirmed, underlying assumptions and using them as the baseline in the decision-making process.

Kahneman and Tversky's arguments cast a negative light on heuristics as the origin of errors and mistakes. Some authors reject this approach to heuristics. G. Gigerenzer argues that heuristics do not always lead to worse decisions, or that people use heuristics only because of a person's limited cognitive abilities. According to G. Gigerenzer, the use of less information and fewer real-world computations leads to time-saving benefits, which heuristic decision making enables (Luan et al. 2019). G. Gigerenzer emphasizes the benefits that these heuristics bring. The penetration, however, is that heuristics, whether positive or negative, allow us to understand how the decision-making process takes place in real-world settings.

4 Discussion

The significance of the above findings seems to be even greater nowadays due to the increasing importance of the so-called soft factors of enterprise location (Domański and Libura 1986). This leads to the question whether, given the decline in the importance of traditional factors, which are becoming commonplace almost everywhere as a result

of globalization, the availability of information and new technologies, the decision to locate a business will not increasingly be the result of a subjective image of space in the minds of a few key decision-makers? Let us not forget that it is not only businesses themselves that decide where to do business, but also the state and political power in the country that guide these decisions in space. In a space that may not reflect economic reality. In a space that may be the subjective idea of the decision-maker. A brief overview of the findings of behavioural economics for the area of business location is presented in Table 2.

Table 2 - Significant insights of behavioural economics in the theory of localisation

Author	Year	Contribution
H. Simon	1955	A general model of bounded rationality that applies to firm location decisions as well.
K. Lynch	1960	Mental map research - emphasizing the importance of elements, space is subjective because people remember different elements.
P. Gould	1966	Spatial preference maps - Gould explored the attractiveness of residential locations, but his method can also be applied to firm location theory.
A. Pred	1967	As a result, he fit a model of bounded rationality to the theory of firm location in the Pred matrix. He further described the imitation effect of firms' location decisions.
G. Tornquist	1970	He points out the diminishing role of transportation as a location factor and the high need for personal contacts and information exchange between enterprises.
M. Hurst	1974	He proposed the Hurst matrix and suggested that firm location decisions are influenced by economic and non-economic factors.
F. Hamilton	1975	Suggests the importance of the general perception of the environment as a location that is the result of a trade-off between different sets of interests.

Source: own processing according to (Sabat and Pilewicz 2018)

At a time when business intelligence systems can surgically calculate costs and benefits accurately given a wide variety of hard decision factors, we find the above insights of behavioral economics to be extremely beneficial and worthy of further exploration.

In economic science, behavioural economics opens up a space for qualitative investigation of seemingly traditional theories such as the localization of the firm. Our paper aims to encourage economists to broaden their knowledge with this perspective and to find the courage to abandon classical methods of investigation. The topic offers a wide scope for conducting empirical experimental studies, which we consider as a means of bridging the existing gap between research and managerial practice.

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