

## **Information asymmetry in economics**

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### **Abstract**

The subject of the article is the concept of information asymmetry, which currently belongs among highly discussed themes in economics. In the article, we deal with the basic concepts, which play an important role in the overall perspective on the given issue. One of them is moral hazard, which is a fundamental consequence of information asymmetry. The market subjects or individual people often misuse their superior informational capabilities for their own use, but at the same time they inadvertently contribute to the inefficiency of the specific market, which can lead to extensive market failure. Other important consequences include so-called adverse selection, which results in the gradual displacement of good products by inferior ones. The occurrence of adverse selection in the specific market then results in pressure to reduce prices. In particular, the article analyses the current state of knowledge in the area of information economics, on the basis of previously published articles. We also deal with the effect of modern technology on the economic mechanism and information asymmetry. One of them is the internet, which plays a key role in the transmission of information. The aim of the article is to perform an analysis of the current state of knowledge in the area of information asymmetry on the basis of relevant published articles, and thus create a comprehensive and compact perspective on the given issue. An important section is the analysis of the possible impact of modern technology on information asymmetry, where own conclusions are drawn on the basis of findings by various authors.

### **Keywords**

Information asymmetry, markets failures, economic information, market inefficiency, moral hazard

**JEL Classification:** D82

### **Introduction**

Why is it so difficult to sell an automobile in excellent technical condition for an appropriate price? Can we rely on and abide by doctors' instructions, when we have limited information on and knowledge of the given issue? Why does the insured usually treat the insured property less responsibly? Do market failures have something to do with the market subjects' different informational capabilities? These are just some of an enormous number of questions which, for a long time, the field of economics could not answer satisfactorily. Only after the publication of several key economic articles and concepts were answers found to some of the questions (Riley, 2001).

Asymmetry, existing in various forms, has accompanied us through many scientific fields since time immemorial. A key type of asymmetry, which fundamentally affects economic fields, is information asymmetry. The concept of information asymmetry has been a part of various economic theories for almost fifty years. Of course, this does not mean that economists did not deal with the issue of informational dissimilarity before that. World-renowned economists were fully aware of the differences in individual market subjects' informational capabilities. Nevertheless, for a long time nobody dealt with this concept in more detail (Wallezky, 2007).

The aim of the article is to perform an analysis of the current state of knowledge in the area of information asymmetry on the basis of relevant published articles, and thus create a comprehensive and compact perspective on the given issue. It focuses primarily on the information asymmetry which occurs in financial markets, and which was one of the main causes of the global financial crisis.

### **1 Basic concepts connected with information asymmetry**

Before we get to the actual examination of current knowledge in the area of information asymmetry on the basis of previously published articles, it is appropriate to define some important basis concepts which are closely connected with information asymmetry.

The elementary concept which needs to be defined is information asymmetry itself. What is information asymmetry? In publications, one can find many definitions of information asymmetry, which mutually overlap. According to Sojka (2001), information asymmetry means that "economic subjects on one side of the market have much better information than the subjects on the other side" (Sojka, 2001, p. 40). According to Šulc (2012), information asymmetry occurs when "one side of the market is less informed than the other side" (Šulc, 2012, p. 192). In other words, the asymmetric distribution of information occurs when one side of the market is better informed than the other side.

We do not necessarily only have to look for such situations in economic sciences; they also occur regularly in various life situations outside economics. Information asymmetry is a consequence of certain secret or hidden information or activity which one side has at its disposal, unlike the other side. On the basis of the secret information, they then gain a significant advantage over other market players during various decision-making problems. "Secret activities are those which cannot be observed by other subjects accurately and without significant additional costs. Secret information corresponds to situations in which one side of the market has more professional knowledge than the other." (Soukupová et al, 1996).

In his article, George Stigler (1961) stresses the very important fact that the cost of procuring information is not zero, which is why economic subjects do not search for all information. From this it follows that the asymmetric distribution of information can be reduced, or even completely eliminated, but at the price of increased overall costs. Thus, it is quite normal for subjects which have completely different information frameworks to meet on the supply and demand sides of the market. According to Stiglitz (1973), this means that the economic phrase "supply equals demand" is highly misleading, and practically inapplicable under realistic conditions; something with which we can certainly agree.

#### Information gap

Wallezký (2007) has introduced the term "information gap" to Czech terminology to describe the difference in individual market subjects' informational capabilities. The author defines the information gap as the difference in relevant information between two market subjects. A positive information gap is associated with a market subject which possesses better information than another market subject. If the market subject is at a disadvantage, and does not possess the given information, a negative information gap arises in regard to the subject which possesses the information. To describe the removal of the information gap, the author introduces the term "filling the information gap".

#### Adverse selection

In principle, we distinguish between two types of information asymmetry, which have a significant impact on the functioning of markets. These are information asymmetry about price, and information asymmetry about quality. One of the serious consequences of the effect of information asymmetry is so-called adverse selection.

Adverse (negative) selection is a state where quality products are displaced by low-quality ones. This effect can often be observed in the labour market, where highly productive employees leave and inexperienced or less productive ones are hired. A fundamental role here is played by information asymmetry on the employer's or employee's part. The employer will almost always be less informed about a certain employee's abilities than the specific employee. In this case, the employer has very limited options of removing the information gap. On the other hand, the better informed employee has no reason to share the information about their abilities with the employer (Sojka, 2001).

Specialized companies, which focus on gathering the relevant information, which they trade and thereby can reduce the information asymmetry between both sides, deal with the afore-mentioned issue, and not only in the labour market.

We can find another example of information asymmetry in the insurance market. We can gradually observe deterioration in the structure of insured persons, which causes an overall increase in the riskiness of insurance companies' portfolios, for example in life insurance. Nowadays, the situation is such that non-smokers pay a part of their insurance policy to cover smokers, which is why they are gradually losing interest in this type of insurance (Šulc, 2012).

A key consequence of adverse selection is considerable market distortion, which can develop into their inefficiency and subsequent market failure. As a result, a large quantity of poor quality goods is then sold by dubious companies.

#### Moral hazard

Another concept, which is undoubtedly connected with information asymmetry, is moral hazard. Moral hazard is the result of natural, not quite positive, human characteristics. It consists of the deliberate misuse of its own position by the side which is better informed. Suppose a homeowner whose house is insured can take less care of their house than if they had not insured it. The problem lies mainly in the fact that the insurance company which arranges the policy does not know the insured person's exact

intentions – it is not sufficiently informed. Of course, in the opposite case, the price of the policy would be much higher. It is therefore quite rational to believe that moral hazard acts as impulse for the gradual increasing of prices, not only in the insurance market but in the economy in general (Šulc, 2012).

## **2 Current knowledge in the area of information asymmetry**

Information asymmetry was indirectly dealt with as early as the 1950s by the famous economist F. von Hayek. In his article “The Use of Knowledge in Society“ Hayek (1945) deals with the problem of ignorance and uncertainty with regard to information about the current state of the market. In particular, the author points out that information can be interpreted by various economic subjects completely differently, depending on their knowledge and experience. His concept of the market as a process of constant changes, and uncertainty with the emergence of unusual and previously unimaginable consequences, is a basic theoretical concept for information asymmetry, despite the fact that the author does not use the term information asymmetry in the article.

A key breakthrough in the area of information asymmetry in economics was the article “The Economics of Information” by American economist George Stigler. Stigler (1961) was the first to announce a basic idea which until that time had not been taken into consideration. According to the author, information represents a certain source of value, meaning that it is not free property, but valuable property. In his article, the author presents example of information asymmetry in various fields. He expresses several concepts with which he factually supports his theory. One of them is the fact that price dispersion occurs not only in heterogeneous products, but also in homogeneous ones. In the article, he proposed and outlined a principle for determining the market value of information. His findings show that the cost of finding information is not zero, which is why economic subjects do not want to possess all the information. He called the search for the market price the “search”, whereby the costs of the search increase with the number of sellers, because the main cost that this activity incurs is time (Stigler, 1961). Stigler's (1961) article aroused the interest of other economists, who began to research the issue of information asymmetry in more depth. In the year 1970, Akerlof published his very successful article - “The Market for Lemons: Quality Uncertainty and the Market Mechanism”. Unlike Stigler (1961), who mainly dealt with information asymmetry about price, Akerlof (1970) focused on information asymmetry about quality, which he declares is present in the used car market. He presents the used car market as a typical market where information asymmetry occurs, leading to so-called adverse selection which deforms this market.

Akerlof (1970) points to the fact that the used car market is dominated by automobiles which hide certain defects. Thus, the public automatically regards every car arriving in this market as defective, even though that may not be completely true. The problem lies in the fact that, without increased costs, one cannot distinguish good cars from those which hide serious defects. Thus, a customer who wants to buy an automobile on the used car market has rational reasons to be concerned that the offered car has some concealed defect.

A common question posed by the buyer might sound as follows: Why would the current owner want to sell the car if it isn't hiding some defect? Why don't they keep driving the car? When we look at the problem from the other perspective, the seller of a good car will not be motivated to sell their automobile, because they know that, thanks to the buyer's afore-mentioned thought process, they would not get an appropriate price for it. Akerlof (1970) draws the conclusion that bad cars displace good cars from the used car market, which is why the average quality of all automobiles on the used car market must be low. The author also points out that a completely new car, which is purchased on a certain day, will have a much lower price/value on the following day, even though its technical condition is still the same.

Another concept which influenced the economic theory of information is the theory of signalling by M. Spence. Spence (1973) reasons that the better informed side of the market has an interest in sharing part of the information with the less informed side of the market, so that it contributes to the more efficient functioning of the given market. The economist J. E. Stiglitz (1973) followed on from Spence's concept with his theory of so-called screening. Screening is basically the opposite of the concept of signalling. It consists of the search for additional information by the less informed side of the market, which results in the subject being better informationally equipped. The search for relevant information is greatly affected by the cost of its procurement. That is why it is appropriate to involve companies specializing in the provision of information, with the aim of reducing the costs incurred by firms during its procurement. At the same time, this makes the specific market's operation more efficient. According to

the author, in cases where the market cannot cope, the government should take steps to prevent potential market failures (Stiglitz, 1973).

S. A. Ross (1973) touched on the theme of moral hazard in his article "The Economic Theory of Agency: the Principal's Problem". According to Ross (1973), a consequence of moral hazard is considered to be the existence of so-called costs of representation, which he defines as a situation where "one party, designated as the agent, acts on behalf of the other party, designated as the principal, under its authorization or as its representative". The problem lies in the fact that the agent may not always act only in the principal's interest; on the contrary, they can pursue their own interest thanks to the fact that they possess better information. If the principal wants to control their agent, they incur the costs of representation (Ross, 1973).

Information asymmetry, as one of the possible causes of extensive market failures, is dealt with by D. J. Porteous (1995) in his book "The Geography of Finance: Spatial Dimensions of Intermediary Behavior". Among others, the author deals with the concept of the regional segmentation of financial markets, which can lead to uneven regional development. He sees the cause in information asymmetry in the credit market. Works by Berliant and Kung (2006) and Boadway (1997), which deal with information asymmetry in the labour market on a regional scale, point to the considerable effect of informational dissimilarity on regional development.

Information asymmetry also has a considerable influence on investors' decisions about the allocation, timing and form of investments, which was already pointed out by Stigler (1961). Other economists who took an interest in the afore-mentioned issue were, for example, Razin et al (1999) and Huang and Lu (2008). In their publications, they deal with the effect of information asymmetry during decision-making by foreign investors about the allocation of capital in overseas markets.

A major theme of the last decade is increasing the transparency of security traders, who can misuse their informational advantages against uninformed parties – retail clients. Information asymmetry, complemented by the moral hazard of some of the large financial institutions in the USA, is generally regarded as one of the causes of the start of the global financial crisis in the year 2008. Since that period, extensive financial market regulations, intended to help suppress these dishonest practices, have been passed. The afore-mentioned theme is dealt with by many authors. One of them, for example, is Yaling Lin (2016), who examines whether the greater transparency of security traders reduces information asymmetry in the financial markets, and thus aids the better functioning of the Taiwanese stock market. By analysing the "entrepreneur - investor" relationship, Batabyal and Nijkamp (2010) discover that investors have a great fear of entrepreneurs' moral hazard when making risky regional investments. They also mention that regional authorities cannot effectively intervene in the "entrepreneur - investor" relationship, because they possess predominantly imperfect information. Therefore, they cannot prevent potential market failures. Thus, the authors came upon a fundamental fact, which is in conflict with the traditional theory of public finance. It assumes that public institutions possess perfect information (Šulc, 2012).

In the real world, public institutions are rarely perfectly informed; instead, they tend to possess poor quality and incomplete information. From this it follows that "the public sector must therefore face information asymmetry directly in the process of the performance of public administration" (Šulc, 2012, p. 192). The works which deal with information asymmetry in the public sector are mainly Boadway (1997), Diamond and Mirrlees (1971) and Vickrey (1961).

### **3 The effect of information technology on information asymmetry**

Will the new information and communication technology help reduce information asymmetry? Does the economic mechanism itself also change, or will everything remain as before? These questions were clearly answered by Václav Klaus as early as the year 2000 in his article "Informační technologie nemění ekonomický mechanismus". Klaus (2000) claims that the basic economic mechanism won't change if scarcity, and the effort to allocate limited resources so that they bring the greatest possible effect, exist in society. The author states that new technology undoubtedly affects certain structural changes which affect the micro-economy, and particularly company functioning models. The completely opposite opinion on the given issue is defended in the article "Informační technologie mění ekonomiku" by Jiří Zlatuška (2000).

The effect of modern ICT on information asymmetry was also dealt with, among others, by Simplicio and Bertrand (2016) in the article "The Role of ICT in Reducing Information Asymmetry for Financial

Access“. The authors state that new technology reduces information asymmetry, and also aids the better allocation of resources. Gajewski and Li (2015) analyse whether the internet has a positive impact on the reduction of information gaps between individual market subjects. Their research shows that the internet helps to reduce information asymmetry under the assumption that the information is easily accessible and comprehensible for internet users.

A key question is whether, on the contrary, information asymmetry is not actually becoming more pronounced with the advent of rapid technological ICT development. A certain overload of unimportant and irrelevant information can occur. First and foremost, the credibility of the information published on the internet is important. Every day, one can find a huge amount of untrustworthy, misleading and inaccurate information on the internet, which can have a hidden manipulative character. Thus, on the other hand, information technology can contribute to the rapid dissemination of such false information, which can have a negative effect on individual subjects' decision-making and result in market inefficiency.

#### **4 Conclusion**

The article deals with information asymmetry, which is one of the main themes in economics in recent years. Several authors even received the Nobel Prize in Economics for their contributions to the analysis of markets with information asymmetry.

In the introduction, we deal with the basic concepts which are closely connected to the article's main theme, which is information asymmetry in economics. Concepts such as moral hazard, adverse selection and the information gap, i.e. the results of the market subjects' dissimilar informational capabilities, are clarified.

The next section analyses current knowledge in the area of information asymmetry on the basis of previously published works and articles. Of interest is the fact that, although information asymmetry has occurred in economics since time immemorial, for a long time nobody dealt with this issue. A key article which contributed to deeper knowledge and defined new theories in the economics of information is Stigler's (1961) article “The Economics of Information”. This article brought new ideas, concepts and theoretical conclusions to the area of the economics of information, which influenced and inspired many economists around the world. The article sets forth examples of markets where information asymmetry is most evident. For example, these include the used car and insurance markets.

Another area on which we focus is information asymmetry in financial markets. We set forth examples of publications dealing with the analysis of the “entrepreneur – investor” relationship, where the investors often fear the entrepreneurs' moral hazard. Information asymmetry also has a considerable influence on investors' decisions about the allocation, timing and form of investments. We deal with the effect of information asymmetry on the outbreak of the global financial crisis, which occurred due to the moral hazard of some large financial institutions. Since then, financial markets have met with extensive regulations, whose aim is to make the financial markets' functioning more efficient and, most importantly, regain investors' trust. For example, research by Yaling (2016) shows that the greater transparency of security traders reduces information asymmetry, and thus aids the better functioning of the Taiwanese stock market.

Another theme of the article is the effect of modern technology on information asymmetry. Does information technology change the economic mechanism? For now, a clear answer probably does not exist. For example, Klaus' (2000) and Zlatuška's (2000) opinions are completely different. On the contrary, according to Simplicio and Bertrand (2016), information technology probably has a positive effect on information asymmetry, which is gradually reduced. Another potential tool for reducing information asymmetry can be the internet. According to Gajewski and Li (2015), the internet helps to reduce information asymmetry under the assumption that the information is easily accessible and comprehensible for internet users.

The question arises of whether, on the contrary, information asymmetry is actually becoming more pronounced with the development of ICT. There is a huge variety of information on the internet. The mere accessibility of the information does not necessarily mean “knowledge” in the sense of its relevance. A certain overload of unimportant and irrelevant information can occur. In such a situation, it will be much more costly to “filter” the relevant information from that which is misleading, imperfect or even completely false. Thus, on the other hand, information technology can contribute to the rapid dissemination of this information, which can have a negative effect on individual subjects' decision-

making and potentially result in market inefficiency. The aim of the article was to analyse current knowledge in the area of information asymmetry. From the performed analysis of the current state of knowledge in the area of information asymmetry, it follows that information asymmetry still raises many questions in economics which are waiting to be answered. One of them is the effect of information technology on information asymmetry in economics, which may play a key role in preventing potential market failures in the future.

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