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Information Asymmetry, Signalling and Screening vs. Audit Culture – Selected Challenges for Academic Governance

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Michał Pietrzak*

A change can be observed in contemporary academic governance – from a trust-based culture towards the audit culture based on accountability. The purpose of this paper is to discuss the problems of such accountability from the economics-of-information perspective. The approach of the article is founded on a review of the most relevant contributions in the area of information asymmetry, signalling and screening and on the analysis based on deductive reasoning. The main finding of the paper is that asymmetrical information embodied in academic work challenges the management of academic staff. Signalling and screening methods, which are popular in business and relevant for the audit culture in the case of academic environment, face important obstacles. This is due to the specificity of work of academic professionals, which is in fact a credence good. It is also predicted that the pressure towards accountability could be used for redistribution of resources in favour of privileged groups of academic staff; privileged in the sense of easiness of measurement and signalling of research achievements.

Keywords: academic governance, information asymmetry, signalling, screening.

Asymetria informacji, sygnalizowanie i *screening* a kultura audytu – wybrane wyzwania dla ładu akademickiego

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Istotnym rysem ewolucji współczesnego ładu akademickiego jest odejście od kultury zaufania na rzecz kultury audytu z jej centralną kategorią rozliczalności. Celem artykułu jest przedyskutowanie problemów związanych z rozliczalnością w kontekście ekonomii informacji. W artykule zastosowano metodę przeglądu literatury z zakresu asymetrii informacji, mechanizmów sygnalizowania i screeningu oraz analizę dedukcyjną. Wykazano, że specyfika pracy akademickiej wiążę się z istotną asymetrią informacji, która rodzi szereg wyzwań wobec zarządzania kadrą naukowo-dydaktyczną. Metody sygnalizowania i screeningu stosowane w relacjach zatrudnienia w biznesie i adekwatne do kultury audytu mogą napotkać trudności w zastosowaniu na uczelniach, w związku ze specyfiką pracy akademików, która nosi znamiona tzw. produktu zaufania. Wskazano również, że dążenie do rozliczalności może prowadzić do redystrybucji zasobów na rzecz grup naukowców o uprzywilejowanej pozycji, jeżeli chodzi o pomiar i sygnalizowanie osiągnięć badawczych.

Słowa kluczowe: ład akademicki, asymetria informacji, sygnalizowanie, screening.

JEL: I23, J44, M5

* **Michał Pietrzak** – PhD (habilitated), Professor at Warsaw University of Life Sciences, Department of Economics and Organisation of Enterprises, Faculty of Economic Sciences.

Correspondence address: Warsaw University of Life Sciences, Department of Economics and Organisation of Enterprises, ul. Nowoursynowska 166, 02-787 Warszawa; e-mail: michal_pietrzak@sggw.pl.

Ministry of Science and Higher Education
Republic of Poland

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1. Introduction

Productivity is a key determinant of the standard of living of societies. It is conditional upon access to outstanding factors of production, with qualified human resources and access to scientific knowledge playing an important role. High qualifications and vast scientific knowledge are goods that, when generated, bring about benefits exceeding individual benefits from investing in their production, that is externalities. This is an argument for the public sector involvement in their production (Porter, 1992), for example in the form of public higher education. Such involvement is connected with regulation of and supervision over public higher education institutions.

Public governance is construed as the manner in which those in power implement policies and related decisions on public life. Academic governance can be defined as a system of organisational processes and arrangements to control universities. Governance mechanisms comprise legal and economic institutions, and governance is strongly associated with the culture of a given society, including the system of informal standards (*Diagnoza stanu…*, 2009; Thieme, 2009).

At the end of the 1970s, Ansoff (1979) developed the concept of OSEs (environment serving organisations) understood as both corporations and public organisations. At the same time, he pointed to the growing alignment of these two organisational types and to the social pressure manifested as the expectation that public organisations would strive for efficiency in a similar vein to enterprises (Ansoff, 1979). These predictions were reflected in the concept of New Public Management (NPM) suggesting that proven tools of professional management such as: clear standards and methods for measuring efficiency, control based on performance measures, quasi-market mechanisms (competition), should be implemented in the public sector (Hood, 1991). As a result, weaknesses of traditional Weberian administration are expected to be eliminated (O'Flynn, 2007).

Currently, NPM not only has become an approach to the management of public administration but also is pervading universities, which is particularly visible in Europe (Schimank, 2005; Tahar & Boutelliern, 2013; Wikesman & Schmid, 2012). As a consequence, universities are increasingly applying methods such as goal setting, benchmarking or efficiency measurement (Parker, 2012; Taylor & Baines, 2012).

The growing popularity of NPM in higher education corresponds to the observed crisis of the traditional (Humboldtian) university paradigm (Leja, 2013; Sztompka, 2016). Kostera puts this change in a broader context of interregnum as viewed by Bauman (2013). Bauman uses the metaphor of interregnum to refer to the present time, which escapes the existing legal framework and social order, whereas a new framework and a new order adapted to the new situation have not yet developed (2012). "The old institutions are dead or are just dying. No new ones have emerged yet.

(…) One institutions in a state of uncertainty is the university" (Kostera, 2013, p. 11).

What university paradigm will emerge from beyond the horizon? Will it be Clark's (1998) entrepreneurial university? A university subordinated to knowledge or a socially responsible university as proposed by Leja (2013) or a McUniversity as viewed by Ritzer (2018)? Or perhaps will we be able to return to tradition by "reactivating the idea of the university " as suggested by Sztompka (2016, p. 55)? I do not undertake to answer these questions. However, I would like to draw attention to a certain aspect characteristic of changes at universities in developed countries, an aspect that is intensifying also in Poland, namely dissemination of the audit culture (Shore & Wright, 1999; Shore & Wright, 2015; Sułkowski, 2016). The audit culture involves the spread of financial audit principles and techniques that are becoming key elements of today's public governance. This governance, including academic governance, is more and more strongly based on measurement systems, rankings and efficiency assessment (Shore & Wright, 2015). The introduction of audit culture mechanisms is justified by the rational argument that those using taxpayers' money should be accountable for the effects to the authorities and the public at large. Nonetheless, these mechanisms may foster the rise of oppressive academic governance and many side effects (Shore & Wright, 1999; Shore & Wright, 2015).

The spread of the audit culture is commonly viewed as the so-called economisation of the university. Paradoxically, however, it is economics that can provide arguments to people who are sceptical about reconstructing academic governance around audit mechanisms. This article seeks to identify limitations to the accountability of academic work from the economics-of-information perspective, with particular focus on signalling and screening. It relies on the literature review method, deductive reasoning and discussion. The literature review is not exhaustive and mainly covers classical texts on economics of information, allowing for the issue of accountability to be regarded in the context of that theory. Based on the concepts of signalling and screening derived from economics of information, deductive reasoning was performed with the use of simple formal relationships and graphic illustrations, following a behavioural assumption about utility maximisation by economic agents and their susceptibility to opportunism. The deductive analysis formed the basis for conclusions and discussion about the limitations to accountability in higher education. The content of this study is divided into five parts, including this introduction. The next part discusses information asymmetry and related costs, and refers these issues to employment relations in higher education. Subsequently, the signalling method is presented as a way of coping with information asymmetry also in higher education. The following section presents the concept of screening, which is a mirror image of signalling, with the difference that it is the employer that initiates the action to overcome information asymmetry in

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this case. The article finishes with the discussion of the findings from the literature review and conclusions.

2. Information Asymmetry and Costs of Overcoming It

As emphasised by Stiglitz, economics of information made a groundbreaking contribution in that it undermined the standard assumption of mainstream economics, namely that information available to economic agents is excellent and costless. Meanwhile, information is imperfect and its stocks vary among different agents (information asymmetry of the parties). Yet, the parties can take action to overcome the difference and to obtain information, which is costly (Stiglitz, 2000).

The key category of economics of information is information asymmetry of the parties. Asymmetry offers advantage to the better informed party. For example, information asymmetry occurs when experience goods are sold, meaning those goods whose characteristics can be known only after their purchase (Tirole, 1988). If the behavioural assumption about people being susceptible to opportunism[1] (understood by Williamson (1985, p. 47) as "self-interest seeking with guile") is adopted, then it can be presumed that information asymmetry will be a problem – the better informed party (here: seller) can use its advantage to sell a product of inferior quality – a lemon.

In his seminal article, Akerlof (1970) analysed the impact exerted by experience goods of diverse quality on the market operation. Where differences in quality exist that are difficult to verify in advance, for example such that are assessed on the basis of general quality statistics for the entire market, an incentive occurs to deliver low-quality products to the market. In the case of such goods, the benefits of offering high quality are gained by the entire group (assessed on the basis of statistics), with a lesser impact on individual suppliers. Akerlof illustrates this by an example of second-hand cars where information asymmetry results from the seller having much greater knowledge about the car as compared to the buyer. The buyer has difficulty distinguishing a good product from a poor one (lemon). As a result, the functioning of the market is distorted. Buyers presuppose the risk of buying a lemon, which leads to a price reduction. It is difficult for the seller of a good-quality car to convince the buyer that the car is of high quality. As a consequence, the seller will either accept its inadequate (too low) price or refrain from selling the car. Hence, good-quality cars will be crowded out from the market for second-hand cars by lemons. Therefore, there is a mechanism consistent with the principle that "bad money drives out the good" (Akerlof, 1970, pp. 489–492).

Transactions involving information asymmetry are susceptible to adverse selection. It results from the inability of one party to the transaction (here: buyer) to distinguish key qualitative characteristics of the good being purchased, with the simultaneous reluctance of the other party (here: sellers

offering lemons) to reveal the true attributes of the good. It is then a type of the asymmetry problem where information is hidden to the detriment of the counterparty (Wilkin, 2016). The problem of adverse selection may be overcome by the less informed party at additional costs (Williamson, 1985). For example, a potential buyer of a car may have various technical inspections performed before the final decision. Yet, first, they raise costs, and second, they reduce but do not solve the problem – full information about the quality of the car can only be obtained *ex post* while using it.

The problem of hidden information particularly affects employment relations; it can be observed, for example, at the recruitment stage. Job candidates are not interested in revealing full information about themselves, especially regarding their weaknesses that may tip the balance of employment decisions to their disadvantage. Employers (or their representatives) will seek to overcome information asymmetry by incurring additional costs – this is essentially the basic function of employee recruitment and selection techniques. Nonetheless, similarly to second-hand cars, the employee selection procedure reduces but does not eliminate the hidden information problem, analogically to vehicle technical inspections. Candidates' qualifications can be ultimately verified only *ex post* (and not always, as mentioned later in this article), which forces employers to hire by trial and error. Spence (1973) describes this as an investment decision reminiscent of buying a lottery ticket. Lotteries certainly differ in winning odds; in the example considered here, the probability of a successful recruitment decision depends on selection costs and on institutional solutions, which does not change the fact of that there is an inherent risk in such a decision. The greater the risk, the greater the danger that employers – similarly to buyers of second-hand cars – will presume that candidates have inadequate qualifications, resulting in the adverse selection mechanism meaning that better candidates are crowded out from the market by worse ones.

This situation may be referred to the recruitment of research and teaching staff. It is common knowledge that a competitive labour market practically does not exist in public higher education in Poland. Of course, scientists change jobs (albeit very rarely) and young staff are recruited (as regards the prevalence of doctoral studies over assistantship, this means employing young PhD staff). At each of these stages, the adoption of a competitive market model as a reflection of the reality requires a particularly great deal of heroism, regardless of the entire bureaucratic guise of competition procedures. In this context, the nepotism and "endogamy" typical of the Polish academic world are criticised (Sułkowski, 2016, p. 33). Recognising the occurrence and the negative impact of these phenomena, I believe that an important part of the problem, however, lies elsewhere. It is information asymmetry and the adverse selection mechanism[2].

Difficulties in verification of job candidates make employers ask the questions: if the candidate is really so good, why is he/she changing a job?;

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if the candidate is looking for a job in the free market, might he or she not be a candidate of high quality (with high qualifications)[3]? A similarity can be noticed to the market for second-hand cars described by Akerlof (1970) where buyers presuppose the risk of buying a lemon. As emphasised by Akerlof, the market for a given good may then disappear altogether (1970). In practice, this does not necessarily mean that no second-hand car will find a new owner, but exchange will take place outside the market, for example a car will be sold to family and friends; in this case, personal ties protect the buyer from hidden information. Analogically, it may be better for a university to employ graduates of its own doctoral studies who may not actually have achieved mastery but at least we know what to expect of them as we have known them, for example, for 9–10 years (master's and doctoral studies at the same university) as compared to external candidates who seem to be better according to recruitment documents, yet the very fact that they are looking for a job[4] through the market (competition) raises doubts and suspicions about them[5].

As claimed by Akerlof, institutions that may arise in such situations can help cope with information asymmetry, such as guarantees, brand names, standardised chains or licensing/certification (1970). It is difficult to imagine that formal guarantees may be provided to recruited scientists. A similar role can, however, be played by the recommendation of a patron whose good name and integrity constitute a warranty of a high quality of the protégé. Yet, such a mechanism may degenerate[6] into ordinary cronyism. From the outside, it is difficult to assess which of the above types of favouritism we are dealing with. A licence in this example is a PhD degree whose prestige may be further reinforced by a strong brand of the university granting it. Nonetheless, this may be insufficient where the market has practically disappeared and the adverse selection mechanism has triggered the following doubts: if he/she is really so good, why did not this prestigious university which granted him/her the degree want him/her? It seems that doctoral schools (envisaged in the Act 2.0 on Higher Education passed recently by the Polish Parliament) are a step towards creating something like a chain/network with a standardised offer. This may increase the role of the market mechanism in the recruitment of young researchers, yet the auxiliary cost of this solution seems to be high, namely further degradation of the master-apprentice relationship.

3. Signalling

One of interesting ways of dealing with information asymmetry is signalling first described by Spence (1973). He used the labour market with information asymmetry to illustrate this mechanism. The employer must offer wages without being able to directly assess the productivity (understood as the value of the employee for the employer) of job candidates. This is

the equivalent of buying an experience good such as a second-hand car. However, the employer can see a range of data about candidates. On this ground, the employer can form an opinion about the conditional probability of certain productivity depending on some observable attributes of the candidate. It is like buying a lottery ticket where it is possible to specify the cash equivalent of a lottery bet offering a given win with a certain probability. Observable attributes of a candidate can be divided into two categories: indexes and signals. Indexes mean attributes that are observable and non-manipulative, e.g. gender, race, age. Signals are observable attributes of the candidate that the candidate can influence, for example the level of education, professional experience (Spence, 1973).

If employers cannot estimate varied conditional probabilities of productivity based on diverse attributes of candidates, they will offer one flat wage rate. By putting all candidates in the same boat, employers will reward worse workers at the expense of better ones. High-quality (highly productive) candidates therefore have an interest in convincing the employer that they are the better ones. This is analogous to second-hand car sellers who want to convince the buyer that their car is not a lemon.

Highly productive candidates may thus seek a signal and by manipulating it, they can demonstrate their unobservable advantage. Of course, such manipulations cost (in a broad sense including monetary costs, time spent, mental costs, etc.). Not every attribute is suitable for this role – "signal will not effectively distinguish one applicant from another, unless the costs of signalling are negatively correlated with productive capability" (Spence 1973, p. 358).

A good example of an attribute that can be a signal is the level of education. This attribute is easily observable and – in contrast to race or gender – can be controlled by the individual. Education is always expensive (regardless of whether there is a fee) in the meaning of opportunity costs. Education lasting longer than the mandatory time can serve as a signal of ambition, diligence, persistence, perseverance in the pursuit of the goal. On the one hand, people with these features can be expected to be more productive; on the other, they can be thought to achieve a certain level of education at a lesser cost than people who lack such features[7]. As a result, the level of education as an easily observable productivity proxy showing a negative correlation of costs with productivity meets Spence's criteria for an effective signal discussed above[8].

Spence indicates that the equilibrium in his model is achieved in the course of iterative runs of the following feedback loop: (1) the employer's belief in conditional probability of productivity -> (2) offered remuneration system as a function of signals and indexes -> (3) candidates' decisions about signalling -> (4) employment, observation of links between signals and productivity -> (1) the employer's belief in conditional probability of productivity, etc. Equilibrium should be understood as a stationary state

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achieved by the above feedback loop, meaning a state in which the individual components of the cycle repeat automatically. For example, at stage (1) of the cycle, the employer's beliefs reaffirm themselves and cease to be modified with an inflow of new information in subsequent cycles (Spence, 1973).

Spence's concept can be applied to universities. Let us assume that academics fall into two categories: those with low (I) and those with high (II) productivity which, however, cannot be observed *ex ante*. Some of them look for a job shortly after obtaining a PhD degree, some change jobs at later stages of their careers. Let us assume that they try to signal their quality as employees through a list of publications or related academic scores (e.g. in Poland academic scores are appointed to any paper in the form of points regarding the perceived quality of a journal). The number of points for publications is a variable, which is, firstly, easily observable; secondly, influenced by the actions of the academic; and thirdly – one could assume a negative correlation of its costs and productivity of an author (people with more academic talent and research passion – features that may be regarded as building a productive capability – should experience smaller difficulties and costs associated with the preparation of publications, especially those with high scores).

A university as a potential employer looks for such a level of signal s^* that would allow for distinguishing between representatives of groups I and II. Let us assume that group I with productivity X is fraction f_1, where unit costs of the signal (1 point for a publication) are c_1 for its members. Group II with productivity Y is fraction $1 - f_1$, where unit costs of the signal (1 point for a publication) are c_2 for its members. The following inequalities simultaneously exist:

$$X < Y \tag{1}$$

$$c_2 < c_1 \tag{2}$$

The expectations of conditional probability assumed by the employing university will be met for group I if (cf. Figure 1):

$$X > Y - c_1 s^* \tag{3}$$

therefore the condition is:

$$s^* > (Y - X)/c_1 \tag{4}$$

The expectations of conditional probability assumed by the employer will be met for group II if (cf. Figure 1):

$$Y - c_2 s^* > X \tag{5}$$

therefore the condition is:

$$s^* < (Y - X)/c_2 \tag{6}$$

To sum up, the condition for equilibrium is such s^* that (cf. (4) and (6)):

$$(Y - X)/c_1 < s^* < (Y - X)/c_2 \tag{7}$$

In equilibrium conditions as described above (7), a candidate from group I, driven by the principle of maximisation of the utility function (defined as a difference between remuneration offered for a given academic score/number of points received $W(s)$ and the costs of obtaining that score/those points, i.e. $c_1 s$), will always choose $s = 0$. Then the value of the utility function will be X. As shown in Figure 1, for any level of $s > 0$, the value of the utility function for group I members will be less than X. Analogically, under equilibrium conditions, a candidate from group II, driven by the principle of maximisation of the utility function (in this case, equal to the difference: $W(s) - c_2 s$), will always choose $s = s^*$. Then the value of the utility function will be $Y - c_2 s$. In the light of the assumptions made, for $s < s^*$, the remuneration of a group II member would be $X - c_2 s$, and yet: $X < Y$. As shown in Figure 1, for any level of $s > s^*$, the value of the utility function for group II members will be lower than that at point $s = s^*$.

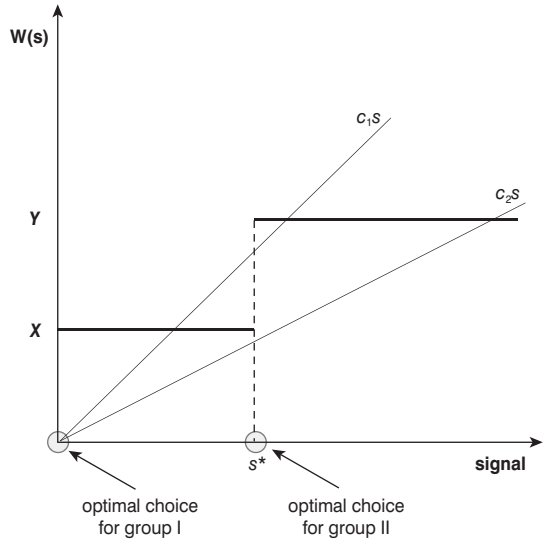

Fig. 1. Remuneration as a function of the level of signal with signal cost curves. Source: Modification based on (Spence, 1973, p. 363).

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What conclusions can be drawn from the equilibrium conditions for the presented model? First and foremost, there are infinitely many s^* that meet the equilibrium conditions (7). Second, not all equilibrium s^* will be equivalent from the point of view of social welfare (Spence, 1973). Mechanisms such as signalling or screening (which is complementary to signalling (Weiss, 1995) and which will be discussed below) do not generate social return – they do not increase production but only affect its distribution (Stiglitz, 1975). In general, signalling will always be disadvantageous for category I employees who, without it, would receive higher (averaged) wages. Assuming remuneration aligned with productivity which can be distinguished thanks to signalling, they will receive wages adequate to their lower productivity. Signalling may be beneficial for group II employees. By signalling, they may receive higher (because non-averaged) remuneration. From the point of view of group II members, nonetheless, the lowest possible (i.e. still satisfying the equilibrium condition) level of s^* is the most advantageous. Any further increase in s^* makes their utility function shrink without any effect on group I members (Spence, 1973), hence it lacks Pareto efficiency.

Moreover, signalling might prove unfavourable also to members of the second group, meaning that their utility function will be lower than in the case of averaged wages (without signalling costs). As claimed by Spence, the equilibrium condition for candidates in group II to find themselves in a better situation thanks to signalling is (1973):

$$f_1 > c_2/c_1 \tag{8}$$

This condition is presented graphically as a hatched area in Figure 2. This area is delineated by dashed lines. The left-hand dashed line means that the signalling cost ratio (c_2/c_1) must be greater than zero. The upper dashed line signifies that the share of group I in the set of candidates must be lower than 1.0. Otherwise group II would not exist. The skew dashed line means that the equilibria satisfying the equation: $f_1 = c_2/c_1$ do not meet the condition of signalling benefits. It should be emphasised that the larger (proportionally) group II is (in other words, the lower f_1), the more difficult it is for its members to obtain benefits from signalling. For example, if the set of candidates is divided in half in terms of productivity, then group II must have more than twice lower costs of signalling than group I in order to benefit from signalling. If group II were dominant, for instance if its share were 90% of the set of candidates, its cost advantage would have to be more than tenfold. If group II is a 10% minority, then it is enough to have slightly over 10% lower costs of signalling in order to benefit from signalling.

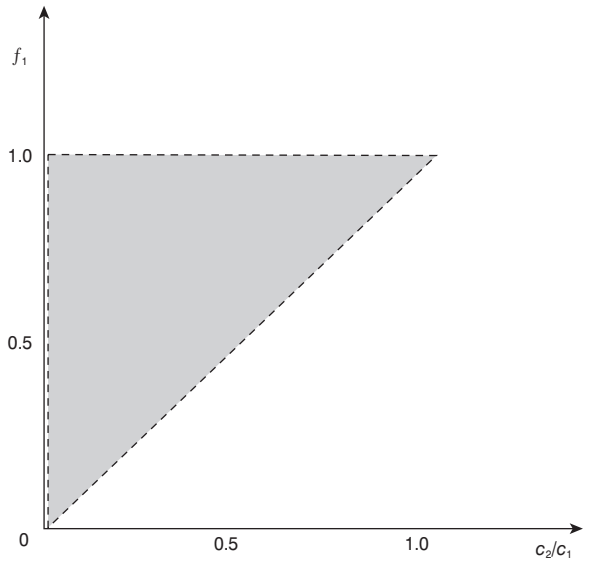

Fig. 2. Condition of benefits from signalling for a more productive group. Source: Elaborated by the author.

4. Screening

I have so far considered information asymmetry in the context of adverse selection, which may be exemplified by employment decisions. Meanwhile, there is also a twin problem of moral hazard. Moral hazard appears in the *ex-post* phase of any contract and involves one party acting opportunistically, for example the insured does not take risk-mitigating actions (insufficient care for the insured property) or the employee works below his/her real capacities, avoids work, etc. The point here is hidden action, meaning a failure to adhere to contract terms by concealing one's actions (Wilkin, 2016, p. 183).

Such behaviours occur where the employer cannot fully supervise employees' work. This is a different case of information asymmetry than before, when it was assumed that the buyer/employer was not able *ex ante* to directly verify the quality of a product (second-hand car) or service (e.g. work provided). It was a typical situation for goods described as experience goods. Yet, there are situations where difficulties arise in assessing the product quality even *ex post*. A special case is the so-called credence goods. Typical examples of this category include: some medical treatments, legal, consulting services, etc. Certainly, the activities of research and teaching staff can also be mentioned here.

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Thus, the employer faces the problem of how to ensure that the employee actually performs productive, high-quality work. The employer can monitor the employee's activities and introduce specific incentives for the employee who in turn can invest in being credible (Jensen & Meckling, 1976). I have so far focused on this second aspect (signalling). It is worth looking now at the other side of the coin, namely screening as termed by the information theory. The theory of screening was put forward by Stiglitz (1975), who understood it as identifying and distinguishing qualitative attributes of goods and production factors, for example labour. Screening is a mirror image of signalling and is qualified under the same category of (selection) methods, with the difference that signalling involves a better informed party (e.g. employee) making the first move while in the case of screening, it is a less informed party (e.g. employer) that takes action (Saczuk, 2003; Weiss, 1995).

One of the main screening mechanisms is self-selection. Let us assume that one of the parties to a contract (e.g. employee) has better information about a certain characteristic (e.g. own productivity or related variables) than the other party (e.g. employer). Let us also assume that representatives of the better informed party differ as regards this characteristic. The less informed party may design a system of rewards and penalties covering two (or more) regimes so that each representative of the better informed party benefits more when falling under one of the categories of the reward-penalty system, while being, however, free to choose the desired regime. A rational decision-maker will choose the regime offering greater benefits. The point is to differentiate the regimes so that the choices made by the better informed party reveal information about the characteristic, for instance productivity, unknown to the other party (Stiglitz, 1975).

From the point of view of the considerations concerning constraints on accountability, the differences between screening and signalling are not crucial. "Traditional academic culture trusted the academic staff, assuming that the professional ethos of the professor makes it mandatory to perform research and teaching work in a decent manner. (…) The shift towards the audit culture means a departure from trust in the employee in favour of motivation and control mechanisms" (Sułkowski, 2016, pp. 25–26). From this perspective, the differences between signalling and screening are not so significant as to prevent further reasoning based on Spence's model outlined above, also with reference to management of already employed academics. For example, Figure 1 can still be referred to. In this case, the 0X axis should be called a screening or selection attribute rather than a signal, yet this does not change the essence of the analysis. As part of screening, the same proxies that served as signals may be used in the self-selection mechanism. Let us assume that a university's research and teaching staff are divided into two categories: little productive (I) and highly productive (II). Nonetheless, considering that work is a credence

good, productivity is difficult to observe even *ex post* (i.e. after the employment decision). Let us imagine that the employer wants to use a periodic appraisal of scientific achievements (measured in points for publications) as part of the reward-penalty system. If the employer believes that a certain number of points (e.g. defined by s^* in Figure 1) is easier to obtain by more productive employees and more difficult to obtain by group I members, then the system of rewards and penalties can be designed so that employees, striving to maximise their utility, self-select themselves into two productivity groups.

The self-selection mechanism may be based on a reward. Then, it will be illustrated by Figure 1 (subject to the above terminological remarks). The employer offers two wage levels: X and Y. X can be treated as a guaranteed wage that each employee is entitled to. A wage increase by $Y - X$ is a reward. It is only granted to those employees who have achieved or exceeded the s^* threshold (in our example – a certain number of points) in the periodic appraisal. Each employee would like to earn Y, yet the achievement of s^* is too difficult (costly) for employees in group I to be profitable, despite the reward (a wage increase).

Alternatively, the self-selection mechanism may refer to a penalty (Figure 3a). That being so, wage Y can be treated as a guaranteed wage that each employee is entitled to. A wage decrease by $Y - X$, that is to $X = 0$, actually means dismissal, which is a penalty. It may be applied to those employees who will not have achieved or exceeded the s_1^* threshold (in our example, a certain number of points). Each employee would like to keep the job and earn Y, yet the achievement of s_1^* is too difficult (costly) for some employees to be profitable, despite the penalty risk. These may be completely accidental employees, employees totally unfit for scientific work or employees with such attractive opportunities to work beyond the university that the effort to achieve the s_1^* threshold is more expensive for them than a job loss at the university. It should be noted that in our graphic example, s_1^* is defined rather liberally ($s_1^* < s^*$), reflecting the negative consequences of numerous layoffs.

The third variant of the self-selection mechanism involves simultaneous reward and penalty (Figure 3b). The employer offers three wage levels: X, Y and Z. Y can be treated as a guaranteed wage that each employee is entitled to. A wage decrease by $Y - X$, that is to $X = 0$, actually means dismissal, which is a penalty that may be applied to employees who will not have achieved or exceeded the s_1^* threshold. A wage increase by $Z - Y$, in turn, is the reward granted to those employees who will have achieved or exceeded the s_2^* threshold. Each employee would like to earn Z, yet the achievement of s_2^* is too difficult (costly) for employees with medium productivity to be profitable. However, they are able to reach or exceed the s_1^* threshold in a profitable manner, which means continued employment and guaranteed wage Y.

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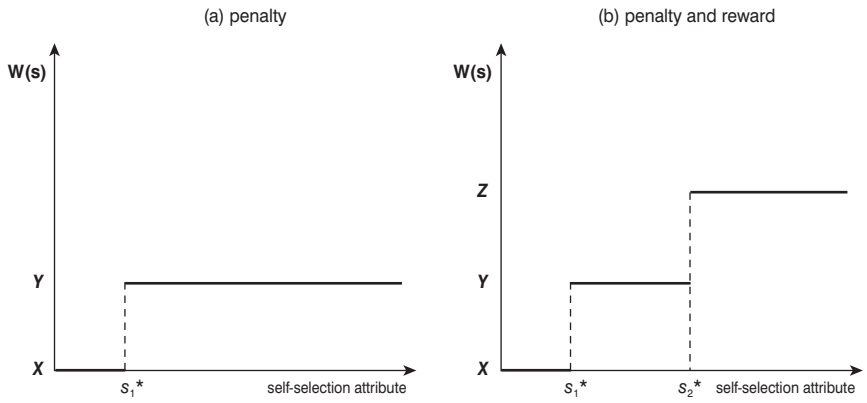

Fig. 3. Examples of screening mechanisms for self-selection. Source: Elaborated by the author.

5. Discussion and Conclusions

As the audit culture develops, screening mechanisms are becoming increasingly important in academic governance of public universities in Poland. When I started my academic work two decades ago, the self-selection mechanism based on penalty was a secondary element of management (working as an instrument of last resort, when no persuasion helped), which then relied on the trust-based culture rather than on the audit culture. The s_1* level within this mechanism (cf. Figure 3a) was defined very liberally. Dismissals were extremely rare and practically always concerned work outside the university that proved to be so attractive and engaging that some colleagues could not meet even low publication expectations.

Since then, screening has been steadily gaining in importance. Yet, the impulse in that direction was top-down – it came from the level of external academic governance. The translation into internal governance was a derivative consequence of external pressure. Subsequent guidelines, ways of scoring journals, monographs, and conference proceedings changed every few years as academics were gaining knowledge of how to find their feet in a new system of constraints. However, such learning did not always follow the intentions of those developing constraints. It is worth quoting Mintzberg's still valid statement about professional bureaucracy (a type of organizational structure whose archetype is the university): "those outside the profession – clients, nonprofessional administrators, members of the society at large and their representatives in government – see the problems [of incompetent, unreliable employees – MP] as resulting from a lack of external control (…). So they do the obvious: try to control (…) with

direct supervision, standardization of work processes, or standardization of outputs. (…) instead of achieving control of the professional work, [they] often serve merely to impede and discourage the professionals (…) forcing the professionals to play the machine bureaucratic game – satisfying the standards instead of serving the clients" (Mintzberg, 1979, pp. 376–377).

In the context of the abovementioned signalling and screening models, it can be pointed out that the observable bureaucratic game of the number of publications and academic scores/points results from deficiencies of such variables as signals or productivity proxies. Notably, differences in costs arising from the manipulation of productivity signals (proxies) between groups of employees with diverse potential proved to be impermanent. If a variable seemed to strongly discriminate the potential of researchers (and as a result, increasingly stronger stimuli were associated with it), it turned out that sooner or later academics with not necessarily the greatest potential would find a way to manipulate this variable at a lower cost than they seemed (at the beginning) to have to bear[9].

In this context, some decision-makers (and probably many colleagues from academia) might regard scores for publications in journals from the special list prepared by the Ministry of Science and Higher Education and citation indexes or similar variables as almost the mythical philosopher's stone serving to change non-productive, parochial (as often claimed) Polish academics into productive aces of the world science. We should agree on one point, namely that these variables appear to be – at least now – much more resistant to the devaluation of variables such as the number of publications. Typically, it can be assumed that a publication in a journal with an impact factor (IF) (especially a high one) is much more difficult than in a mediocre national journal. It requires deep knowledge of the world literature, interesting empirical research, language skills and awareness of the publication standards. For this reason, it can be a productivity signal (proxy). Furthermore, the differences in the costs of such signalling appear to be far more permanent than in the case of number of publications. Accordingly, such signals may prove to be much more effective in the selection of employees. Yet, do we – as a society and as a community of researchers – really want this selection?

Two doubts that arise here are worth noting. The first one should be looked at from a broader national perspective (from the level of external academic governance). It is commonly known that it is much easier for the representatives of natural sciences to publish in international journals with an IF as compared to the representatives of social sciences and humanities. The society (represented by the government and its agencies) can be perceived as the employer that hires all research and teaching staff in public higher education. These employees form two groups: representatives of natural sciences and others. Is there a common denominator for the concept of productivity (understood as the value offered by the employee to

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the employer) of such a wide range of employees? It seems that there is not, and even if there is, how to operationalise it? Meanwhile, it can be presumed that the representative of the employer (society), or the government and its officials, would like to receive and use such a common denominator. It is worth referring again to Figure 2. Although they constitute a significant fraction of scientists, representatives of natural sciences (who can here be classified to group II – not because they are more productive but because they are potentially interested in signalling) have on average a significant cost advantage (in a broad meaning) over colleagues from other disciplines in terms of publications in top journals, citation indexes, etc. Accordingly, they also have an interest in signalling on the basis of such variables. Regardless of whether the starting point is the concept of signalling by scientists or screening by the government and its agencies, the expected result may be similar. It is the diversity of payments that under this approach should be interpreted as funds allocated to natural and other sciences. From this point of view, the increased importance of parameterisation and of the role of academic scores, citation indexes and similar variables can be seen as a threat to social sciences and humanities.

The second doubt is associated with what Thaler describes as "supposedly irrelevant factors" (2016, p. 3). Essentially, the above discussion about signalling and screening concerned motivation-related issues. As far as costs were concerned, it was emphasised that they are broadly understood (monetary costs, time, psychological costs) whereas benefits encompassed only wages. Meanwhile, "motivation refers to the forces either within or external to a person that arouse enthusiasm and persistence to pursue a certain course of action" (Daft et al., 2010, p. 605). The focus on wages can certainly be accepted in deductive modelling that is to help identify some meaningful dependencies (which I hope has been achieved) but, in the long run, it is impossible to ignore two additional sources of motivation, notably in scientific and teaching work. These are social motivation (recognition or rejection/neglect by the environment) and intrinsic motivation (intrinsic rewards and penalties).

According to the model in Figure 1, a group I employee – with a steep cost curve c_1s – will not get involved in providing s ($s = 0$) whatsoever. In practice, the situation will often be different from what the model predicts because such an employee is affected by social influences and intrinsic motivation (e.g. pride in achievement) in addition to wage X included in the model. Nonetheless, consolidation of the audit culture leads to the implementation of motivational systems similar to those existing in corporations, in accordance with the pay-for-performance slogan. My observations suggest that this is an increasingly frequent phenomenon, with wage stimuli becoming stronger. For instance, at one of the economic departments in Poland, the best researcher (according to the performance appraisal based on the scores obtained for publications in top journals)

received additional remuneration much exceeding a typical annual salary of a professor. As emphasised by Baron and Kreps (2013), there is a danger that the pressure on wages may blunt, destroy, and in extreme cases even reverse intrinsic motivation. Signalling and screening essentially involve the selection of employees. What will be the longer-term motivation of those who will not qualify for group II? And such academics still exist and will be quite numerous in a couple of years. Will they engage in their job if they feel the social stigma of being inferior and internal frustration? After all, they cannot be quickly replaced by young, talented and ambitious people. Moreover, the question is: will such people ever come? The amount of public money devoted to science in Poland is relatively low and not growing. In fact signalling and screening are distribution actions (some lose for others to gain) and do not produce any additional value.

Meanwhile, intrinsic motivation is often crucial where employees are in a better position (as compared to their bosses) to make a real-time assessment of what action to take and in which sequence and where the difference between sufficient and outstanding performance of a task is of particular value to the employer (Baron & Kreps, 2013). These situations perfectly reflect the nature of an academic's work. To ensure that actions by such an employee are compatible with employers' interests, the latter can take advantage of three socio-psychological processes: (1) motivation to do a good job, (2) a sense of obligation to give something back as reciprocity – gift exchange, (3) internalisation of the employer's or another group's welfare (Baron & Kreps, 2013, p. 319). All these processes have been integrated into the traditional academic culture based on trust and high professional ethos of the scientist. I believe that the university will not get out of the crisis without rebuilding these values (no matter how difficult it is and how long it could take). Reliance on accountability cannot replace these values and, in a longer term, may lead to abandoning the ideal of the academy for the sake of a hybrid of a bureaucratic office (with a huge number of rules and procedures instead of self-control of peers within the community) and a business corporation (with the rat race instead of intrinsic motivation).

Endnotes

1 This does not mean that all people are opportunist but only that some may be, and people's credibility is rarely visible *ex ante* (Williamson, 1998).

2 Attention should also be paid to the problem with broadly understood mobility. Apart from cultural issues, it is largely determined at the national level by low earnings in relation to housing prices and rental costs.

3 For example, in Gibbons and Katz's (1991) model, the decisions of companies to dismiss employees are regarded by other companies as a sign of poor quality of the employee being dismissed.

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[4] A potential employer may interpret this fact as a "rejection" by the home university where the candidate obtained a PhD degree (equivalent to dismissal from a company).

[5] "If the decision on who should be dismissed and who should not is the responsibility of the company, it can send the market a message about the quality of employees. Therefore, dismissed workers [here: fresh PhD researchers looking for a job at another university – MP] can be perceived in the market as people with low qualifications" (Saczuk, 2003, p. 32).

[6] Protection can only be provided by high moral standards of both the patron and the person receiving the recommendation.

[7] Furthermore, it is worth noting that – as demonstrated by Stiglitz – selection mechanisms used in the education system (when students are admitted, move to subsequent stages, are evaluated) are as such a source of additional information differentiating candidates (1975).

[8] Although this not an issue to be considered in this study, it is worth noting that the concept of signalling can explain investment in education as an alternative to the human capital theory (better educated people, thanks to useful qualifications that they can use at work, are more productive). I share Weiss's (1995) opinion that the concept of signalling should be preferably perceived as an "extension" of the human capital theory and what should be considered is a combined effect on remuneration of education understood as a factor directly affecting productivity and as a signal of certain characteristics and predispositions conducive to productivity.

[9] This mechanism seems to be analogous to the advancing devaluation of higher education diplomas and their signalling role.

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