Signalling Theory, Education Policy and Labour Market Efficiency: A Review of Prof Garry Becker

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ABSTRACT

This paper reviews the concept of signalling theory in the economics of education, focusing on Gary Becker's (1964) contributions. In the labour market, employers' uncertainty about potential employees' competence and honesty inspires signalling. According to signalling theory, education serves as a signal to employers about an individual's productivity and potential. This review examines Becker's contributions to signalling theory and its application to labour market outcomes, exploring implications for education policy and labor market efficiency. While this paper is a theoretical review, signalling theory has empirical applications in economics of education, informing policymakers and educators about the strategic and efficacy cost of signalling. Understanding signalling theory's implications can help create a more efficient education system and labour market. Consequently, this paper presents two frameworks: the Signalling Theory-Productivity Framework that explains the processes of signaling towards organizational productivity; and the Signalling Theory and Labour Market Efficiency Framework which provides a testable structural model. Finally, we argue that the quality of employer's signalling attraction depends on the individuals' honesty in education, training acquired and the cost of signaling.

Keywords: Signalling theory, education policy, labour market, economics of education, Gary Becker

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INTRODUCTION

The labour market and its employment structure have evolved due to various influencing factors over time (Vitali, 2020). Thus, signalling theory, also known as signalling hypothesis, has its roots in economics of education, management, finance and military (Schreurs, Derous, De Witte, Proost, Andriessen, & Glabeke, 2005; Smith, Johnson, & Williams, 2020; Bafera, & Kleinert, 2023). Gary Becker, a Nobel laureate in economics, contributed to the development of signalling theory, particularly in the context of human capital and labour economics. According to Becker, education and training serve as signals of an individual's productivity and ability (Becker, 1964). The concept was emphasised by Michael Spence in 1973, in his work on job market signalling. Spence's theory suggests that one party (the sender) conveys information to another party (the receiver) through signals or cues to reduce information asymmetry. From Becker (1964) and Spence (1973), education/training and labour market play key roles in application of signalling theory.

In recent times, developing economies have been facing the challenge of employment. The employment saga cut across the youths and mobile workers. The mobile workers, in this context, are those already working in very ridiculous employment but wish to migrate to a better job. The reality in these economies is that the job available does not provide desired employment for the millions of youths graduating from the Colleges of Education, Polytechnics and Universities annually. This gives a chance for the labour market to be strongly competitive. Hence, the issue of signalling becomes a strong communication tool for both employer and the job

seekers because both individual and organization observe signals (Karasek III, & Bryant, 2012). This was the argument of Prof. Gary Becker in the 1960s, an education economist, about signalling theory.

Signalling theory is a concept in economics and sociology that explains how individuals convey information about their characteristics, abilities, or intentions to others through observable signals. Signalling theory, therefore, is about decision-making, communication and signal cost (Connelly, Certo, Reutzel, DesJardine, & Zhou, 2025). In the context of education and labour markets, signalling theory suggests that education serves as a signal to employers about an individual's productivity, ability and potential. Connelly et al. (2025) argue that "the power of a signal, though, lies in its cost, with the best signals being highly costly for low-quality signalers and less costly for high-quality signalers" (p.24). In another dimension, Sabato (2021) applies the theory to violent behaviour while BliegeBird and Smith (2005) consider it as strategic interaction and symbolic capital.

Experts in economics of education have long recognized the importance of education in determining labour market outcomes. One key concept in this field is signalling theory, which suggests that education serves as a signal to employers about an individual's productivity and potential. Gary Becker, a Nobel laureate in economics, made significant contributions to the development of signalling theory and its application to labour market outcomes.

Hence, setting the limitation of the paper, it is not an empirical paper but a review paper of the work of Garry Becker on how signalling theory is relevant to the policymakers, organizational managers and individuals seeking a job in the labour market. Simply, this paper reviews Becker's work on signalling theory and its implications for education policy and labour market efficiency.

Signalling Theory: A Review

Signalling theory posits that education serves as a signal to employers about an individual's productivity and potential (Becker, 1964). This signal can take the form of a degree, certification, or other credential (García-Aracil & Albert, 2018). Employers use this signal to make inferences about an individual's ability and potential for job performance. Becker (1964) was one of the first economists to formalize the concept of signalling theory. He argued that education serves as a signal of an individual's productivity, and that employers use this signal to make hiring decisions. This is emphasized in the case of military (Schreurs, Derous, De Witte, Proost, Andriessen, & Glabeke, 2005).

Becker's Contributions to Signalling Theory

Becker's work on signalling theory built on the earlier work of Spence (1973). Becker (1964) developed a model of signalling theory that emphasised the role of education in signalling an individual's productivity. He argued that education serves as a signal of an individual's ability and potential for job performance, and that employers use this signal to make hiring decisions. Becker's model of signalling theory has been widely influential in the field of economics of education, finance and sociology (Bartolacci, Bellucci, Corsi, & Soverchia, 2022).

The Mechanism of Signalling Theory

It is essential to understand the mechanism of signalling theory especially from the rudiment which centres on four arguments. First, a signal is an observable characteristic or action that conveys information about an individual's underlying traits or abilities. Second, the actor is the signaller, that is, the signaller is the individual who sends the signal, in this case, the job applicant or an employee. Third is the receiver of the signal. The receiver is the individual or organization that interprets the signal, in this case, the employer of labour. Finally, the last mechanism is the information asymmetry. The signalling theory assumes that there is an information asymmetry between the signaler and the receiver, meaning that the signaler has more information about their abilities than the receiver which he showcases to the receiver (Spence, 1973). The mechanism is presented in Figure 1.

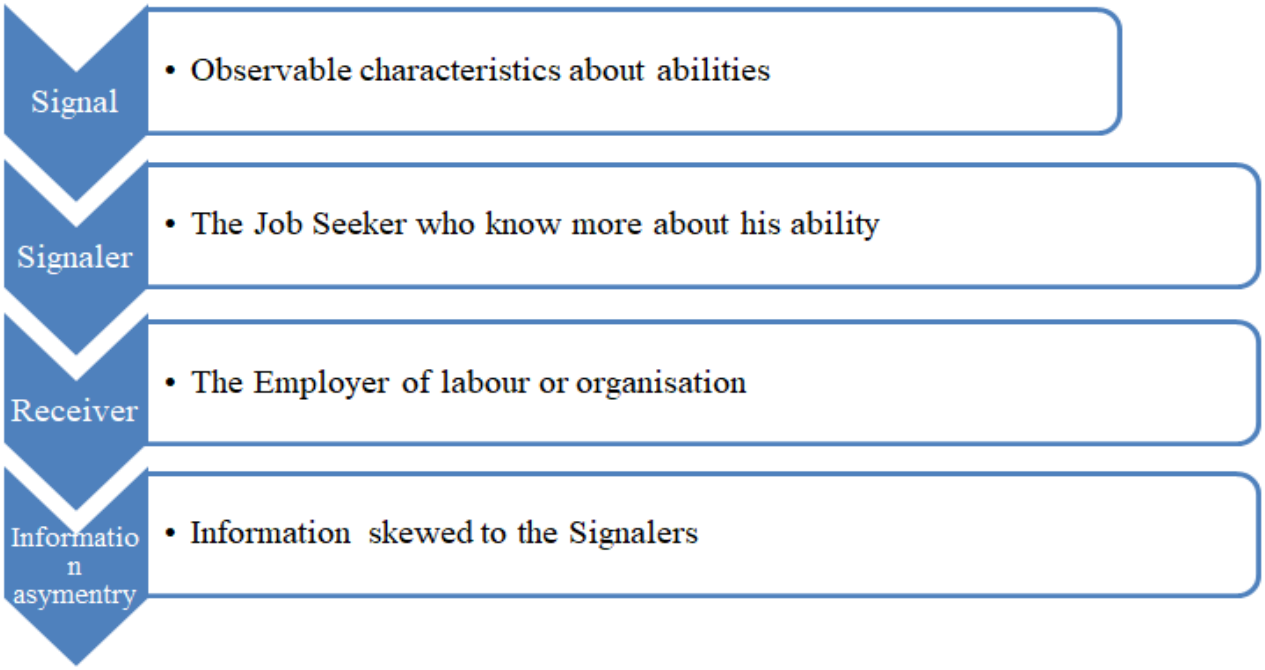

Figure 1: Mechanism of Signalling Theory

Source: Author

How Signalling Theory Works in Education and Labour Markets

This section discusses how the theory embraces the relationship between education and the labour market. Firstly**,** many countries use education as a base of their economy, especially South Korea (World Bank 2006)., While education in the capitalist economy serves as a signal to employers about an individual's productivity, ability, and potential of the job seekers (Karasek III, & Bryant,. 2012), the first contact attraction provides basises for recruitment into the military organization (Tversky & Kahneman, 1974; Schreurs et al., 2005). It is well researched that competency characterised recruitment (Schreurs et al., 2005). The level of education dictates the type of employees to be employed per organisation. There are five levels of education comprising no education, primary school level, junior secondary school level, senior secondary level and post secondary education level (Obasuyi, 2018).

Secondly, the certification and credentialing emphasise the relevance of signal theory in the labour market. In other words, educational certifications and credentials, such as degrees (B.Sc. M.Sc. and PhD) and diplomas (OND, HND), serve as signals to employers about an individual's level of expertise and competence (García-Aracil & Albert, 2018; Büchel, & Pollmann-Schult, 2004). For example, Using German Life History Study (GLHS) which accounted for the selective school qualifications, and the selective choice of vocational training programs with varying levels of quality, Büchel, & Pollmann-Schult, (2004) argue that the type of school diploma obtained has a strong effect on the later risk of overeducation. Also, it depends on the type of job available and the professionalism of the job seeker. For example, the technology industries tend to employ more computer scientists and computer engineers than any other certification in sciences and technology. A financial organization would prefer a Chartered Accountant as a Bursar or Finance Manager than an economist (Vitalli, 2020). Finally, the employer interpretation is important in how signalling works in the labour market, that is, employers interpret the educational signals as a way to assess an individual's potential for job performance and future success (Spence, 1973).

Effects of Signalling Theory for Educational Development

Signalling theory has important implications for education policy. One key implication is that education policy should focus on improving the signalling value of education, rather than simply increasing the quantity of education (World Bank 2006). This can be achieved through a variety of means, such as improving the quality

of education, increasing the rigour of academic standards, and providing opportunities for students to acquire skills and certifications that are valued by employers. Another implication of signalling theory is that education policy should take into account the potential for signalling to lead to over-education. Over-education occurs when individuals acquire more education than is necessary for a particular job, simply to signal their abilities to employers (Spence, 1973; Hartog, 2000; Büchel & Pollmann-Schult, 2004; McGuinness, 2006). This can lead to inefficiencies in the labour market, as well as wasted resources.

Specifically, first, this theory proposes improvement on the signalling value of education. Rather than simply increasing the quantity of education, signalling theory suggests that education policy should focus on improving the signalling value of education, This can be achieved through improving the quality of education, increasing the rigour of academic values and providing opportunities for students to acquire skills and certifications that are valued by employers

Second, over-education is expected in a competitive market where employers seek the best of employees (Büchel & Pollmann-Schult, 2004). Hence, signalling theory highlights the potential of over-education. If over-education is noticeable to education policymakers, education policy could be tailored towards encouraging students to pursue vocational training or apprenticeships, provides alternative pathways to skills acquisition, such as online courses or certification programs, and promotes the value of experiential learning and work experience.

Third, education information transparency and accountability is required to hold signalling theory. While working on the human capital theory, Becker (1964) laid the foundation for understanding the role of education in signaling productivity. Researchers have since explored the implications of signaling theory for education policy, emphasizing the need for transparency and accountability in ensuring that education systems serve as effective signals of productivity. Signalling theory suggests that education institutions, especially universities, should provide clear and transparent information about their programmes and outcomes. The transparency and accountability of education information tends to reduce education information asymmetry between employers and students (World Bank 2004). Signalling theory tends to improve accountability of education information across educational institutions thereby improving the overall quality of education for the economy, especially developing economies.

Fourth, education is a screening device. signalling theory suggests that education serves as a screening device (Stiglitz, 1975), thereby allowing employers to identify individuals with certain characteristics or abilities for organizational performance.

Fifth, signalling theory usually and positively increases over-education. Where the demand for education increases the level of education, where not necessary is a significant factor of signal theory. Signalling theory applicability proposes over-education, where individuals acquire more education than necessary for a particular job, simply to signal their abilities to the potential employers.

Finally, credential inflation exists in signal theory applicability. Signalling theory stimulates credential inflation, where the value of educational credentials decreases over time, leading to an increase in the level of credentials required for a particular job (Collins, 1979; Brown, 2001; Bills, 2003; Gerber & Cheung, 2008)

Signalling Theory and Labour Market Efficiency

The earlier experts in economics of education consistently relate signalling theory with labour market efficiency (Spence, 1973; Becker, 1964; Arrow, 1973; Stiglitz, 1975; Blaug, 1987). To Spence, he introduces the concept of signalling theory in the context of labour markets arguing that they are positively correlated. Gary Becker's book on human capital theory discusses how education serves as a signal to employers about an individual's productivity and potential. Kenneth Arrow's paper discusses how higher education serves as a filter, signalling to employers that graduates have acquired certain skills and knowledge. Joseph Stiglitz's paper develops a theory of screening, which explains how education serves as a signal to employers about an individual's potential productivity. Finally, Mark Blaug's book provides an overview of the economics of education, including the role of signalling theory in explaining labour market outcomes.

Hence, labour market efficiency refers to the ability of the labour market to allocate workers to jobs in a way that maximizes economic efficiency and productivity. An efficient labour market is characterized, first by *clearing of the market,* that is, the presence of labour market equilibrium exists such that the supply of labour equals the demand for labour, resulting in minimal unemployment and underemployment. Second, the issue of *optimal matching* where workers are matched with jobs that best utilize their skills, abilities, and preferences, leading to maximum productivity. Third, it allows for *free entry and exit* of the labour market: in other words, at will, the potential workers are free to enter and exit the labour market; likewise the firms are free to hire and fire workers. This brought about the efficient allocation of labour resources available. Fourth, there exists *perfect information*. Workers and firms have access to complete and accurate information about job opportunities, working conditions, wages, and enhancing informed decision-making. Finally, it embraces *flexible wages and prices* in the labour market. Wages and prices adjust freely to changes in supply and demand for labour thereby allowing the labour market to respond efficiently to shocks and changes.

Cost of Signalling

Signalling is not achievable without certain costs, such as strategic and efficacy costs (Grafen, 1990; Maynard Smith & Harper, 2003). In essence, the cost of signalling refers to the expenses or resources required to convey information effectively. According to Grafen (1990), strategic costs are associated with the reliability of the signal, ensuring that the signal is honest. Lower-quality individuals often incur higher strategic costs, making it difficult for them to fake signals. This concept is particularly relevant in evolutionary biology, where signalling theory suggests that honest signals can be evolutionarily stable when signalling costs depend on an individual's quality (Grafen, 1990). In addition to strategic costs, efficacy costs are necessary for conveying information effectively, such as the energy required for signal transmission (Maynard Smith & Harper, 2003). In the context of job market signalling, Alós-Ferrer and Prat (2012) argue that signalling costs relate to the precision of grades and qualifications, such as university degrees and certificates. Employers use these signals to assess job seekers' qualifications, highlighting the importance of understanding signalling costs in various contexts.

Another aspect of the implication of signalling theory with labour market efficiency is discussed from three perspectives.

First, the *Labour Market Efficiency and Information Asymmetry* is about signaller information. Information asymmetry refers to a situation where one party in a transaction or relationship has more or better information than the other party. This can create an imbalance of power and can lead to inefficient or unfair outcomes. Hence, signalling theory highlights the importance of reducing information asymmetry between job applicants and employers. This is possible through the standardization of examination and certification, transparent and consistent reporting of educational outcomes and encouraging employers to use skills-based hiring best practices.

Second, the *Labour Market Efficiency and Job Matching.* Again, we discuss how job matching is essential in the context of signalling theory, especially the labour market efficiency. In the labour market, there are job mismatches. Signalling theory suggests that labour market efficiency can be improved by reducing the mismatch between job applicants and job requirements. To avoid this, the policymakers need to provide students with career guidance and counseling, encourage employers to provide clear and transparent job descriptions and promote the use of skills-based hiring international practices

Finally, the *Labour Market Efficiency, Unemployment and Underemployment.* It is understandable that signalling theory highlights the potential for signalling to lead to unemployment and underemployment due to variation in certification, abilities and skills. Having this challenge, expectedly, the labour market policy should be re-focused on providing training and up-skilling programs relevant for workers at a given time and place, encouraging employers to provide on-the-job training and development opportunities as an when due and finally promoting the use of flexible and adaptable hiring practices. The Signalling-Productivity Framework is presented in Figure 2.

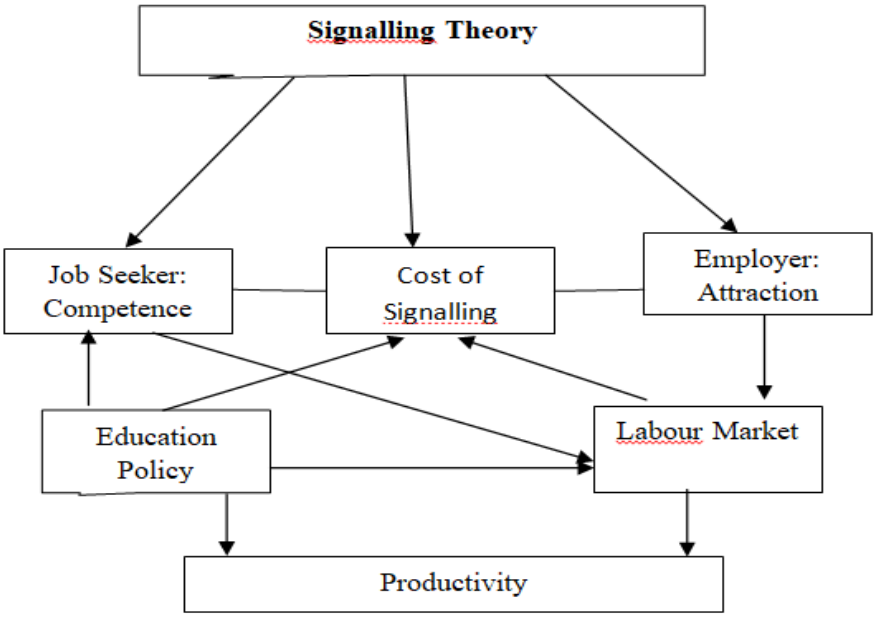

Figure 2: Signalling-Productivity Framework

Criticisms and Limitations of Signal Theory

Although signal theory has been applied in education, economics, sociology, it is not without limitations leading to its criticisms. While scholars in the field of economics of education explore the theory, there is oversimplification in explanation and practice. The theory oversimplifies the complex relationships between education, employers, and job applicants. Again, it ignores other factors that affect hiring labour. Such other factors include personal connections (friends and families, political affiliates), work experience, and the acquired skills of the signaler. Finally, like the utility function, it assumes rational behaviour. Signalling theory assumes that employers and job applicants behave rationally, which may not always be the case.

Moreover, in the context of human capital and signaling, the signaling model of education differs from the human capital model in its assumption that an individual's innate productivity is revealed by their level of education, rather than being directly improved by it. In other words, education serves as a signal to employers about a worker's pre-existing abilities, rather than increasing their productivity through skill development (Page, 2010). However, according to Weiss (1995), human capital and signaling models of education can complement each other. Education can have a dual role, both increasing productivity and serving as a signal of innate abilities. In this context, signaling can be seen as a natural extension of human capital theory, where unobservable productivity differences are linked to the costs associated with education.

Again the variability of the concept is weak in terms of Context-Dependent Signaling: The signaling value of educational degrees can vary significantly across advanced economies, influenced by factors like skills gaps and internal homogeneity within educational groups. This variability highlights the need for context-specific understanding of signaling theory's applicability (Heisig, 2018). While considering the empirical issue of signaling, there is an unresolvable debate. The debate between human capital accumulation and signaling theory is empirically challenging to resolve. Studies have struggled to distinguish between the two effects, making it difficult to determine the relative contributions of each of the variables (Huntington-Klein (2021).

Again, Ghazarian,. (2015) argues on downplaying education benefits. In other words, signaling theory focuses on the symbolic and social value of education, potentially downplaying its actual benefits, such as skill development and knowledge acquisition. This narrow perspective might lead to an incomplete understanding of education's role in society.

However, despite these limitations, signalling theory remains a widely accepted concept in economics and sociology, providing insights into the ways in which education and labour markets interact.

Signalling Theory Testable Hypotheses

The study therefore develops a framework that leads to hypothesis testing.

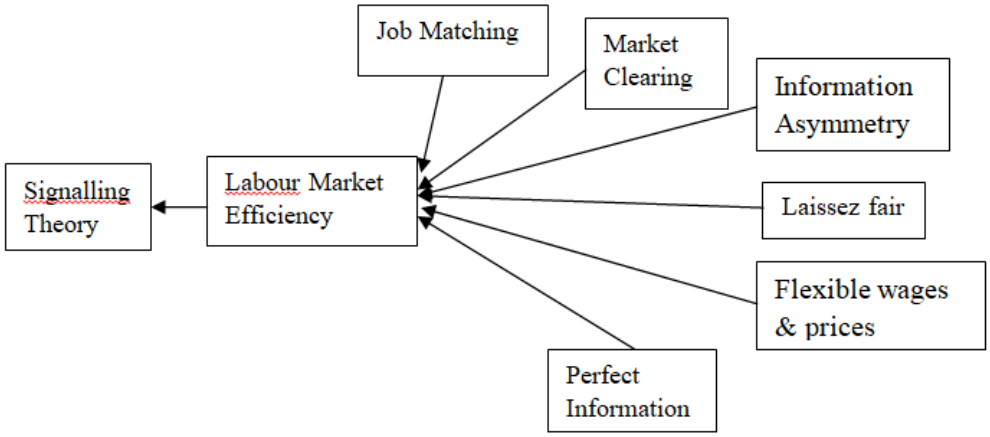

Figure 2: Signalling-Productivity Framework

CONCLUSION

This study reviews Gary Becker's work on signalling in relation to signaling theory and labour market efficiency. Signalling theory, a key concept in the economics of education, has been widely influential, and Becker's contributions are seminal. According to Becker, education serves as a signal to employers about an individual's productivity and potential, linking human capital and signalling theory. He emphasizes that education is a form of investment in human capital, leading to higher earnings and better job opportunities.

As illustrated in Figure 2, signalling theory provides valuable insights into the complex relationships between education, labour markets, and economic efficiency. Our analysis highlights the implications of signalling theory for education policy and labour market efficiency, arguing that policymakers can create a more efficient labour market by improving the signalling value of education and addressing potential over-education. Understanding Becker's position on signalling theory enables policymakers and educators to create a more efficient education system and labour market through quality education and financing. Furthermore, we argue that the cost of signalling is connected to individual honesty in utilizing signal resources, promoting quality signalling. Employers use strategic and efficacy costs of signaling to assess job seekers' qualifications, underscoring the importance of understanding signalling costs in various contexts. Thus, we argue that the quality of employer's signalling attraction depends on the individuals' honesty in education, training acquired and the cost of signalling,

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Declaration of Conflict

There is no conflict of interest to declare.

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