

Factors Affecting Labour Productivity in the Construction Sector

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Abstract: Labour is a key factor in increasing productivity, working more efficiently, and using available resources more rationally. The labour is influenced by the level of education, skills, and motivation to work more effectively to achieve the company's goals. This paper is a theoretical study to investigate the factors influencing productivity in the operation and development of a construction company. The aim of the study is to investigate the factors affecting labour productivity in the construction industry by exploring the concept of productivity and classifying the most important labour productivity factors. The authors provide an overview of the most important labour factors that can improve the productivity performance of a construction company. Analysing the concepts and approaches of different authors in classifying labour productivity factors, the authors have concluded that the most important productivity factors affecting the construction industry are labour factors, firm management factors and technological factors. Based on the theoretical study, it can be argued that time, cost, and quality are the key elements of labour productivity planning in construction. The labour productivity factors classified later in this paper can be used to carry out empirical research in construction companies.

Keywords: productivity, labour productivity, construction sector, skilled labour

Introduction

One of Latvia's development visions (priorities) by 2027 is a knowledge-based society, which is realised by fostering productivity based on the commercialisation of knowledge, creating a skilled labour that meets demand. Productivity is boosted by new knowledge and technologies, extensive learning opportunities, investment in human capital to turn knowledge into higher value-added products (National Development Plan..., 2020). Higher value added to products can be achieved by increasing productivity (Saulāja et al., 2016).

With increasing globalisation, labour productivity is becoming an increasingly important factor in the rational use of public, municipal and private resources. Labour productivity can be an important source of savings in public, municipal and private resources, leading to better and higher quality services for customers.

Construction in Latvia is a labour-intensive sector and depends on the skills of its workforce. This is also explained by the fact that labour costs account for 30-50% of total direct construction costs (Gupta et al., 2014). For industry and business to thrive, the potential of the labour force must be fully exploited, and the rational use of other productive resources must be promoted, since the skills of the labour force depend to a large extent on the use of other productive resources (Purmalis, 2011).

The impact of productivity on industry and company performance has been studied by both Latvian and foreign researchers, and the labour has been cited as a key factor in increasing productivity (Znotiņa, et al., 2011; Marshall, 2012).

The aim of this article is to investigate the factors affecting labour productivity in the construction industry.

The following **tasks** are advanced to achieve the set aim:

1. to analyse the concepts of productivity and labour productivity;
2. to identify the factors affecting labour productivity in the construction industry.

Methodology

The article is based on theoretical research. It is based on an analysis of the literature on labour productivity factors (Shashank et al., 2014; Karim et al., 2013; Goel et al., 2017; Almamlook et al., 2019; Hickson et al., 2013). The literature reviewed includes scientific sources on the interpretation of the concept of productivity and the analysis of labour productivity factors relevant to the construction sector. The study focuses on the assessment of labour productivity factors in construction companies.

Results and Discussion

The concept of productivity

Productivity enables businesses to be competitive, achieve their objectives and add value to products and services. At industry level, productivity enables you to keep customers satisfied, raise investment, and contribute to national economic growth and prosperity (Durdyev et al., 2011).

Productivity is the concept of how well resources are used to achieve certain company objectives or results. The definition includes different perspectives such as creativity and innovation, where the aim is to achieve more results with less input, by redesigning production methods or service delivery processes and optimising the use of resources (Durdyev et al., 2011).

The value of productivity is measured based on efficiency and effectiveness to achieve an accurate and true value. In the case where productivity improvement is only driven by increasing output in quantitative terms, this may lead to an increase in the share of low-quality products and services (Roghanian et al., 2012). It is therefore essential to assess the contribution of each factor of production involved.

R. Pritchard (1995) highlights two approaches to improving productivity in a company - changing the technology used or changing the way employees work.

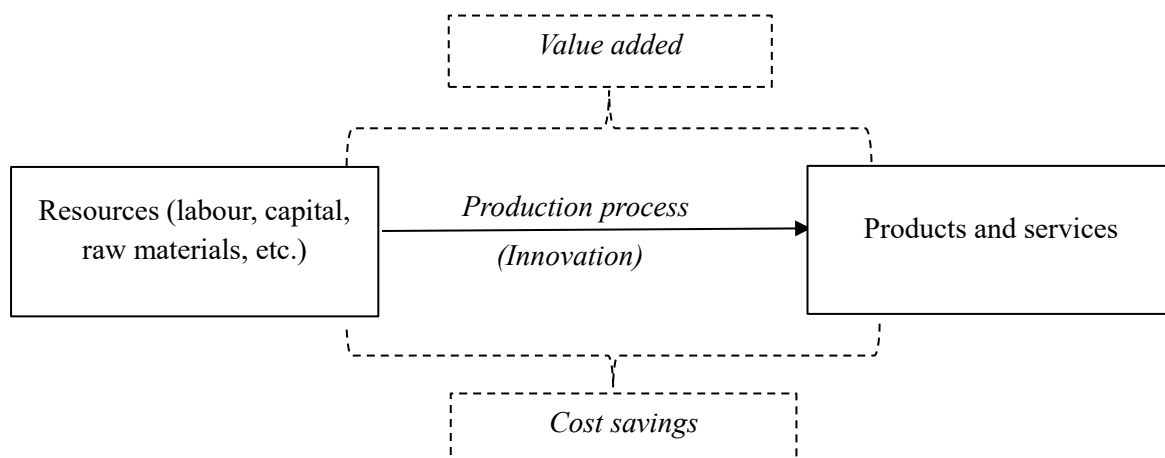


Figure 1. **Productivity characteristics**

Summarising the authors' (Shashank et al., 2014; Karim et al., 2013, Goel et al., 2017) explanation of productivity, it can be concluded that the concept of productivity includes inputs such as labour, capital, materials, and technology (Figure 1). Productivity can be defined as the amount of value added by each input used in the production process, such as labour or technology. The added value of each input is significant. By using different inputs (labour, capital, raw materials, etc.) in the production process, entrepreneurs can use different innovations to produce goods and services with higher added value. By adopting innovative techniques, consumers can also receive goods and services with higher quality and added value, which can lead to significant cost reductions.

According to A. Harberger (1998), productivity can be a source of cost savings in the production process. Despite the explanations given by various authors, there is no single classification of productivity factors.

According to V. Goel, R. Agrawal and V. Sharma, both internal and external factors influence productivity (Table 1). Internal factors include labour-related productivity factors and firm-related

factors that are within the control of both the individual and the firm. External productivity factors, on the other hand, cannot be influenced but can be anticipated in advance and, as a result, preventive measures can be taken to mitigate their negative effects.

Table 1

Analysis of productivity factors

Productivity factor category		Breakdown of productivity factors
Internal factors	Labour actors	Motivation and enthusiasm Employee education Employee attitudes, values, skills Employees' physical and mental well-being
	Company factors	Working conditions Salary Working environment Company structure, culture Company Human Resource policy Adoption of technology
External factors	Industry factors	Number of competitors in the sector Presence of a regulatory authority in the sector
	National factors	National macroeconomics Government regulatory environment and policy developments
	International factors	Migration of skilled workers between countries Technological development World macroeconomics

Source: made by the authors according to Goel et al., 2017; Enshassi et al., 2007, Hickson et al., 2013

Productivity is linked to labour factors such as motivation, education and skills, physical and mental well-being. Company factors that can influence productivity are working conditions, the wage system, the working environment, the company structure, personnel policies, and the introduction of technology into the production process.

External factors affecting productivity are factors at industry, national and international level that are external to the enterprise and beyond the direct control and influence of the enterprise.

Labour productivity can be used to monitor the impact of labour market policies, to understand the impact of wages on inflation, to enhance understanding of how the labour market affects living standards (Key Indicators of..., 2016).

Labour productivity in construction sector

In construction, productivity is closely linked to labour productivity, the units of work done or produced per man-hour. Productivity is the ratio of output to all inputs used in the production of output (Attar et al., 2012).

Several academic studies (Loganathan et al., 2018; Mahamid, 2020; Liu et al., 2008; Joseph et al., 2017) have recognised that the construction workforce has a significant impact on total output. Various labour factors such as education level, qualifications, skills, and competences of workers are important factors influencing the construction labour (Muhammad et al., 2015; Bound et al., 2019).

The concept of labour productivity encompasses a number of variables that can be grouped together and that can affect labour productivity at enterprise level.

P.R. Ghate, A.B. More and P.R. Minde (2016) highlight that there are three key planning elements in construction projects: time, cost, and quality. These elements are intrinsically linked to labour productivity. The main elements influencing labour productivity in construction are: 1) skilled labour; 2) availability of materials on site; 3) availability of machinery on site; 4) construction methods; 5) leadership skills of the project manager; 6) communication between the construction manager and the workforce; 7) training of the workforce.

B. Hickson and A. Ellis classify labour productivity factors into 4 groups: management factors, technology factors, human resources/labour factors, and external factors (Hickson et al., 2013). The company's management factors include lack of supervision, work planning and expectations of workforce performance, lack of leadership by the work manager, payment delays, lack of communication between the work manager and workers, lack of training for workers, etc. The most important technological factors affecting labour productivity in construction are delays in information requests, overworked workers, changes in order volumes, lack of clarity in technical specifications, etc. Lack of experienced workforce, insufficient qualification and motivation of labourers, and physical fatigue of the workforce were cited as the most important human resource factors. External factors on labour productivity were weather conditions during the construction process (Hickson et al., 2013).

According to W. Alaghbari, A.A. Al-Sakkaf and B. Sultan (2017), five key factors are identified as having the most significant impact on productivity in construction: 1) experience and skills of workers; 2) availability of construction equipment on site; 3) site management; 4) availability of construction materials on site; 5) political and security situation.

Productivity depends mainly on the effort and performance of the labour force. Low productivity is one of the main reasons for time and cost overruns in construction projects (Akbar et al., 2021). The main finding of the study on what affects construction productivity is that unskilled and inexperienced construction labour produces less output, so the project is more likely to be unable to recoup the investment within the expected timeframe, which reduces the possibility of raising funds for the site, and therefore threatens the project's viability. Lack of employee experience forces management to spend extra time training employees, which in turn affects productivity.

R. Almamlook, M. Bzizi, T. Ali, M. Al-Kbisbeh and E. Almajiri (2019) classify productivity factors into three main categories: 1) management; 2) technology; and 3) human/work. The main factors affecting productivity in the construction sector are (1) lack of labour supervision; (2) labour experience and skills; (3) construction technology; (4) coordination between construction sector disciplines; (5) errors in project drawings.

Productivity growth is constrained by skills shortages and the mismatch between skills available on the labour market and labour market demand (Baranova et al., 2019).

According to A. Enshassi, S. Mohamed, Z. Mustafa and P. Mayer (2007), productivity factors in construction can be divided into three groups: labour factors, management factors and motivational factors. Labour factors affecting labour productivity in the construction sector include lack of work experience, disloyalty of employees, employee dissatisfaction, lack of competition, increasing age of employees, absenteeism of employees, personal problems of employees. Factors mentioned by the management group include lack of supervision, misunderstandings between employer and employee, lack of work meetings. Motivational factors are late payment, lack of a financial incentive system, failure to provide transport, failure to provide meals and rest facilities.

Summarising the theoretical framework on labour productivity factors in the construction sector and using Drewin's Open Conversion System (DOCS) (Assbeihat et al., 2015), which describes the overall process of a construction system, from internal factors such as employees, capital, materials, equipment and many external factors such as government, economic conditions, environmental factors, etc., the authors divided productivity factors into three major groups: (1) employee productivity factors; (2) company management factors; and (3) technological factors (Figure 2).

The total productivity factors that determine the productivity of construction enterprises can be divided into factors that directly affect each indicator in the group of productivity factors and factors that have an indirect impact on productivity. Directly influencing factors can be determined, changed, and adjusted by the worker and the enterprise, while indirect influencing factors are beyond the control of the enterprise and the worker, but can have a significant impact on the quality of the products or services produced.

Labour factors that affect construction productivity can be viewed from the individual level, such as the education, experience and skills of workers, the qualifications acquired by workers, motivation, and attitudes. These factors are developed on an individual basis for each worker. At company level, the employer can adapt and change various employee-related factors that can increase the overall

productivity of the company. For example, incentive and bonus systems, remuneration systems, on-the-job training, and matching employees with the right experience and age for the job.

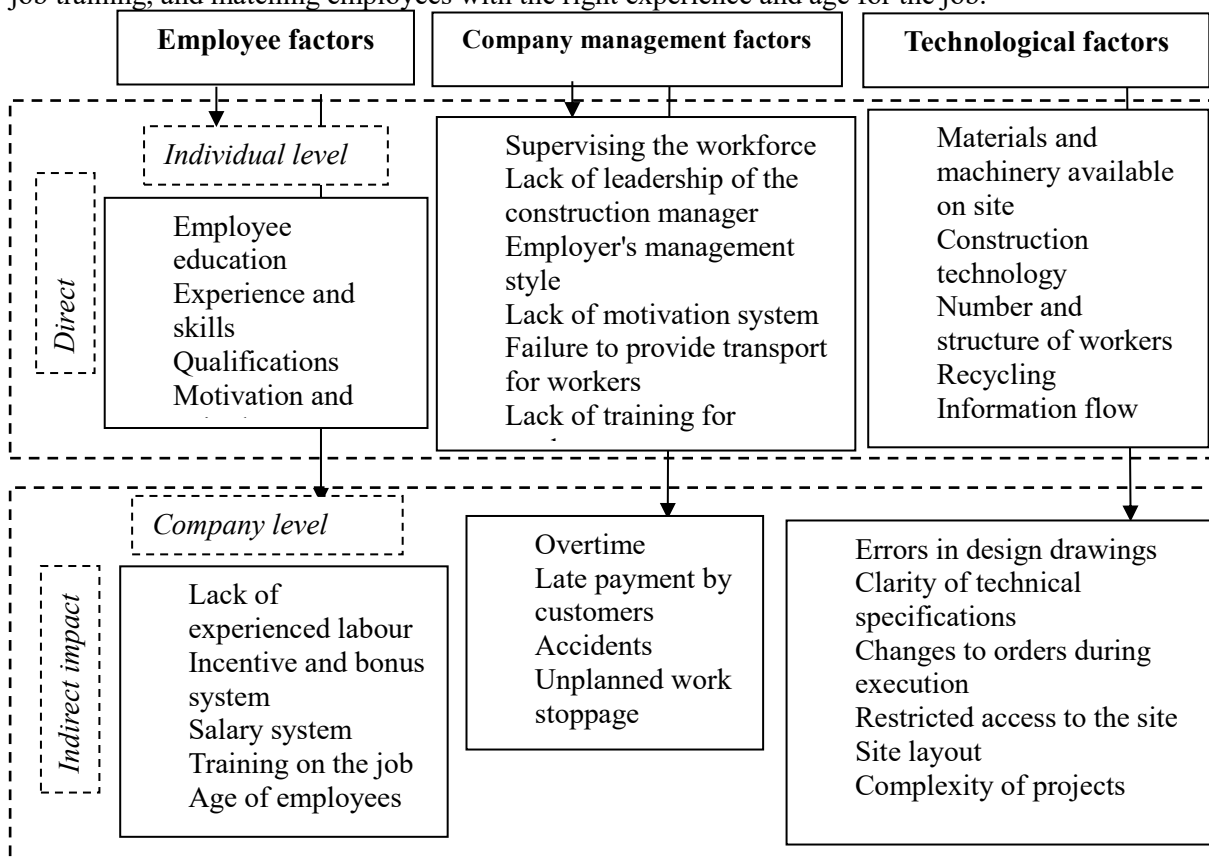


Figure 2. Classification of labour productivity factors for construction enterprises

The determinants of the management of the enterprise that have a direct impact on the productivity of the construction workforce are the supervision of the workforce, the lack of leadership of the construction manager, the management style of the employer, the lack of a motivation system, the lack of transport for workers, and the lack of training for workers. These factors can be directly influenced by the entrepreneur to boost productivity. Indirect influences include overtime, late payment by clients, accidents on site and unplanned work stoppages.

The most important technological factors that have a direct impact on the productivity of construction companies are the materials and machinery available on site, the construction technology, the number and composition of workers on site, the processing of construction work, and the flow of information between the client and the contractor. Indirect impacts are classified as errors in design drawings, clarity of the technical specification, changes to the order and design, limited access to the site, site location, complexity of project construction.

Conclusions

In today's competitive environment, companies need to be able to produce products with high added value, to leverage innovations in the production process that can significantly increase productivity, which in turn would be a major source of savings at both company and consumer level.

Productivity factors are determined by internal (labour, enterprise) and external (industry, national and international) level factors. One of the most important factors affecting productivity is labour.

In the construction sector, labour productivity is also a key factor affecting productivity, as productivity in construction is closely linked to the skills and performance of workers. Workers with inexperience require management to find additional resources to perform specific tasks.

The labour productivity factors affecting construction companies can be classified into three major groups: employee factors, company management factors and technological factors.

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