An Empirical Investigation of Factors Affecting Construction Sector Labour Productivity in Zimbabwe

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ABSTRACT: *The construction industry plays a strategic role in developing countries like Zimbabwe. This research seeks to empirically determine the main factors affecting construction labour productivity in Zimbabwe. Questionnaires comprising of structured and unstructured questions were used to for data collection. The research employed heterogeneous sampling to select the target population, and fifty (50) questionnaires were completed and analyzed. Using a simple ordinal scale, based on a 5-point Likert Scale; contractors, consultants and professionals expressed their views on the relative importance of twenty-two (22) pre-selected factors on construction labour productivity. Data was analyzed using the Relative Importance Index (RII). The results show that late and or non-payment of wages and salaries, suitability and/or adequacy of capital, non-payment to suppliers, availability of experienced labour as well as education and training are amongst the top thirteen (13) most important factors impinging construction labour productivity in Zimbabwe. Timeous payment of salaries and wages as well as investment in staff training and development are amongst the recommended intervention strategies to improve construction labour productivity in Zimbabwe.*

Keywords: *Construction industry, Environmental factors, Incentive factors, Management factors, Manpower factors, Rank, Relative Importance Index (RII)*

JEL Codes: *D24, F16, J31, J41, J53, J81, L74.*

I. INTRODUCTION

Construction industry productivity and labour productivity are two important aspects that determine the profit and loss of construction business. Construction industry, just like any other industry in the economy has its own contribution to the national Gross Domestic Product (GDP). The fact has been supported by Dhlamini (2012), who indicated that; construction is a major industry throughout the world accounting for a sizeable proportion of mostcountries' GDP and Gross National Product (GNP).The construction sector is envisaged to play a powerful role in economic growth, in addition toproducing structures that add to productivity and quality of life.Authors on construction economics such as Jackman (2010), Myers (2008), Tan (2002), Hillebrandt (2000), Bon (1992), Wells (1986) and Turin (1978) all emphasized the importance of the role that theconstruction sector play in economic growth.

According to Rao *et al* (2015) construction industry is labour intensive and literature showed that the labour cost accounts for 40-65% of the total cost of a project. Improving labour productivity is of paramount importance; it is vital to take control of the factors affecting productivity. Improved productivity can result in improved profitability for the company, improved remuneration for the workers and increased company's contribution to the government fiscus through taxes. Raising labor productivity is made possible through determining and addressing those factors affecting labor productivity.

Background

At independence, Zimbabwe carried over a relatively advanced formal modern sector economy on one hand and relatively backward communal, agricultural and informal sectors on the other hand (Chitambara, 2011). According to Mufuratidze *et al* (2014), the formal sector employed 20% of the labour force while the informal sector employed 80% of the labour force in the 1980s.Employment in Zimbabwe varies from formal to informal which is currently expanding faster than the formal economy. Zimbabwe in its sectors, is characterized by either temporary employment or permanent employment. Mufuratidze *et al* (2014), argued that temporary jobs have become a common phenomenon. This kind of labour market flexibility normally leads to workers being trapped in a loop of vulnerability and decent work deficits.

Knowledge gap

The study fills a gap in knowledge of factors affecting labour productivity in Zimbabwe, which can be used by industry practitioners to develop a wider and deeper perspective of the factors influencing the efficiency of operatives; and provide guidance to construction managers for efficient utilization of the labour force, thereby assisting in materializing a reasonable level of competitiveness and cost effective operation.

Purpose of the study
Labour productivity plays a definitive role in shaping the competitiveness of any company and the economy at large, and helps to create the necessary conditions for economic development. There are many challenges that are faced by the Construction Industry in Zimbabwe, and one of the most important challenges is labour productivity. Chigara and Moyo (2014) noted that; in Zimbabwe, inability of workers to produce at industry set output standards is a clear testimony of declining productivity. Such a decline in labour productivity significantly affects the competitiveness of construction companies. Therefore, the productivity of existing workers in the industry needs to be optimized and improved so as to obtain best returns on investment in manpower. Against this background, this research serves the purposeof empirically investigatingthe factors affecting construction sector labour productivity in Zimbabwe.

Research questions
1) What are the factors affecting labour productivity in construction sector?
2) What are the main factors affecting labour productivity in the construction sector in Zimbabwe?
3) What is the impact of each pre-selected factor on construction labour productivity in Zimbabwe?
4) What is the relative rank in terms of importance of each pre-selected factor?

Research Framework
The study, in order to attain its objectives, it has proposed a framework which links construction sector labour productivity to various categories of the impacting factors as displayed in Figure 1 below;

Figure 1: Conceptual Framework
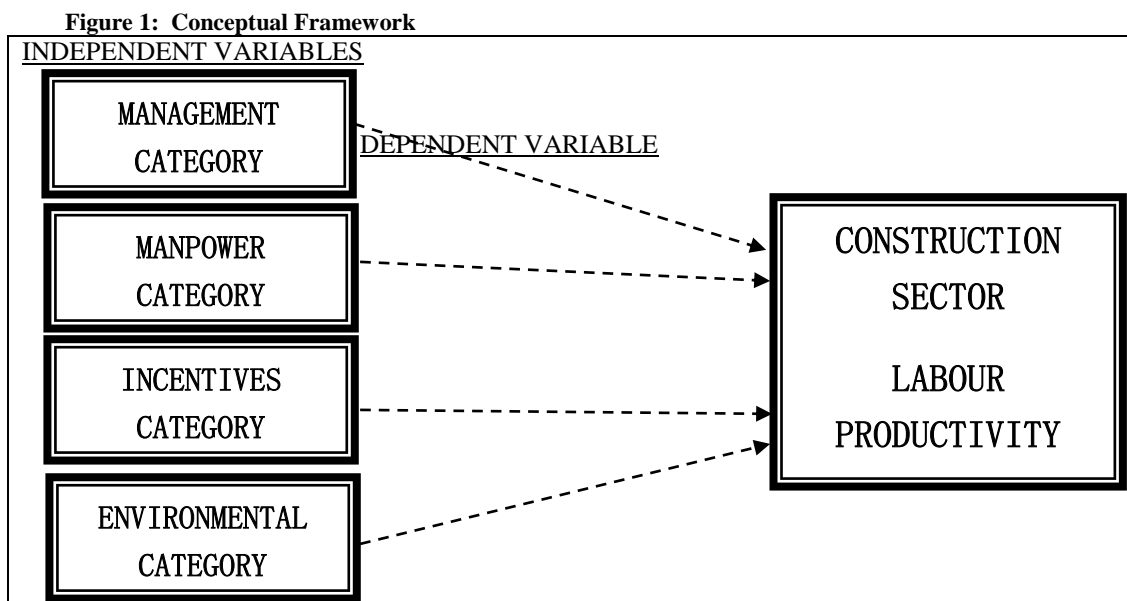
The conceptual framework shows that construction sector labour productivity is influenced by four groups of factors; the management category factors, manpower category factors, incentives category factors and environmental category factors. The study through empirical and theoretical literature review, has managed to identify various factors that can be grouped into four categories. The study seeks to empirically analyse and determine the influence of those factors on construction sector labour productivity.

Organisation of the study
The study comprises of eight (8) sections and these are introduction, national contribution of the construction industry, literature review, materials and methods, data presentation and interpretation, results and discussion, recommendations and conclusion; in their chronological order.

II. NATIONAL CONTRIBUTION OF THE CONSTRUCTION INDUSTRY

The construction industry, just like other industries in Zimbabwe significantly contributes to national progress. The construction industry is an economic investment and its relationship witheconomic development is well posited. Support has been presented by many studies that have highlighted a growing significantcontribution of the construction industry to national economic development(Myers 2013). The contribution of the construction sector to national income for the Zimbabwean economy over the years is presented in Figure 1below:

Figure 2. Zimbabwe Construction Industry's contribution to GDP
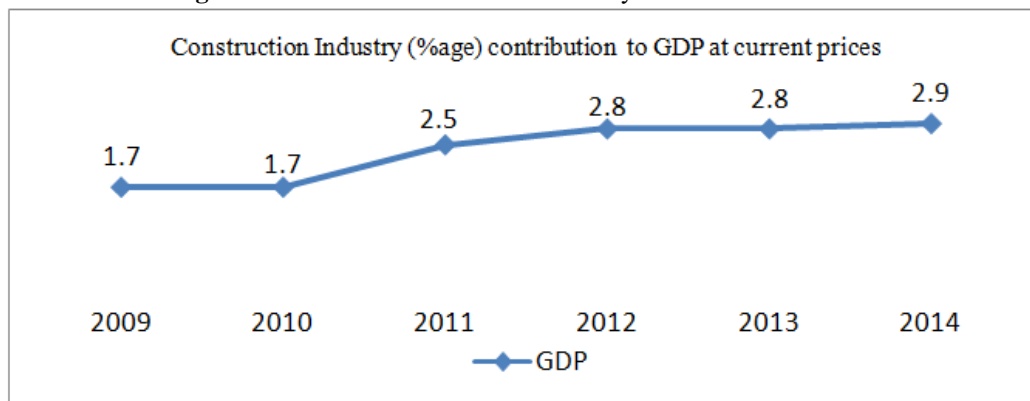
Data Source: ZimStats (2009-2014) National Accounts Report

Figure 2 above shows that Zimbabwean construction industry's contribution to Gross Domestic Product (GDP) is significantly low (though there is a rising trend); duringthe year 2014, it stood at 2.9% from an all-time low of 1.7 % for the years 2009 and 2010. Since then, there was a small increase up to 2.5% contribution to GDP, after which it remained at 2.8% for the years 2012 and 2013. It can be deduced from Figure 1 above that the contribution of the construction industry to GDP is increasing at a decreasing rate and ultimately maintaining an average low of approximately 2% for the period 2009-2014. The low contribution of the construction industry is may be linked to poor labour productivity in the construction industry. Therefore, this research will investigate the factors affecting labour productivity of the construction industry.

Construction Industry and National Economy: Is there any connection?

The construction industry is a driver of economic growth especially in developing countries like Zimbabwe. If the constructionindustry is inefficient, it will be difficult for such a country to attain meaningfuldevelopment.Construction industry has the potential to mobilize and effectively utilize local human and material resources in the development and maintenance of housing and infrastructure to promote local employment and improve economic growth. The importance of the construction industry is unique regardless of whether the country is underdeveloped, developing or developed (Olanrewaju and Abdul-Aziz, 2015).

Field and Ofori (1988) stated that the construction industry makes a noticeable contribution to the economic output of a country; it generates employment and incomes for the people and therefore the effects of changes in the construction industry on the economy occur at all levels and in virtually all aspects of life. This implies that construction has a strong linkage with many economic activities (Bon, 1988; Bon *et al*, 1999; Lean, 2001), and whatever happens to the industry will directly and indirectly influence other industries and ultimately, the wealth of a country. Thus, the construction industry is regarded as a strategic and highly visible contributor to the process of growth.

The connection between the construction industry and the national economy has been strongly argued by Turin (1969) who argued that there is a positive relationship between construction output and economic growth. Therefore,construction industry is an important, investment-led sector in which government should show high interest. The national importance of constructionas an industry cannot be over-emphasized and could be enhanced through adopting efficientmethods of managing resources to achieve increasedproductivity. The current study seeks to empirically examine the factors affecting labor productivity in the Zimbabwean construction industry.

III. THEORETICAL AND EMPERICAL LITERATURE REVIEW

Theoretical Literature

The Continental (Rhineland) Model proposes that stronger labour relations increase labour productivity growth in firms and this again increases the firms' business success (Demeter, *et al*., 2010). This theory identifies factors such as protection of workers against firing, long term contracts, generous employment benefits and strong trade unionism (ability to bargain for higher wages and better working conditions) as affecting labour productivity in a positive manner. In contrast, the Human Capital theory proposes that investments into education increase human capital and consequently increase labour productivity. Therefore, the human capital theory identifies education and training as a critical factor that influences labour productivity. From another point of view, the Efficiency Wage Theory suggests that it is logical for some firms to pay wages that are above

the market wage (that is, above the equilibrium). The logic behind this theory is that labour productivity can be related to wages. This theory purely identifies wages as the fundamental factor that directly determines labour productivity.

Empirical Literature

In Thailand, Makulsawatudom *et al* (2004) looked at the influence of twenty-three factors on the productivity of the construction industry and found that: lack of material; incomplete drawings; incompetent supervisors; lack of tools and equipment; labour absenteeism; poor communication; instruction time; poor site layout; inspection delay; and rework, are the most critical. Abdul Kadir *et al* (2005), in Malaysia, studied the perceived effects of fifty productivity factors on Malaysian residential projects, and identified the following five as most important to labour efficiency: shortage of material; non-payment to suppliers causing stoppage of materials delivery to sites; change orders by consultants; late issuance of construction drawings by consultants; and the incapability of site management. In another similar study, Jarkas and Bitar (2012) carried out a survey in Kuwait and found out that important factors affecting construction labor productivity were: (1) Clarity of technical specifications, (2) Extent of variation/change orders during execution, (3) Coordination level among various design disciplines.

Closer to home, in some African studies; Alinaitwe *et al* (2007) identified thirty-six factors affecting labour productivity in Uganda; incompetent supervision and lack of skills among workers were the most significant ones. Durdyev and Mbachu (2011) identified fifty-six factors affecting labour productivity in New Zealand and the important factors found out were re-work and skill and experience of the labour force. El Gohary and Aziz (2014), study of construction labor productivity in Egypt found that the following five factors ranked in descending order are the most significant in their effects on construction labor productivity in Egypt: (1) labor experience and skills (2) incentive programs, (3) availability of material and ease of handling, (4) leadership and competence of construction management and (5) competence of labor supervision.

In Zimbabwe Chigara and Moyo (2014) examined the factors affecting labour productivity on building projects in Zimbabwe. Their results show that unavailability of materials, late payment of salaries and wages, suitability/adequacy of plant and equipment, supervisory incompetence, and lack of manpower skills, are the top five most important factors impinging on labour productivity in Zimbabwe.

IV. MATERIALS AND METHODS

The study used a qualitative approach and data was collected using a questionnaire approach. The questionnaire was built around factors affecting labour productivity drawn from previous studies and is comprised of both open-ended and closed-ended questions.A pilot study has been undertaken to ensure validity of the questionnaire. The pilot study specific purpose was to; check clarity and appropriateness of questions; check the range of responses and; check the efficiency with which the questionnaire will be completed by the respondents.Hand delivery and emailing of questionnaires to various stakeholders in the construction industry was done to aid the study in answering its research questions. The target population of 50 respondents was selected using heterogeneous sampling.

Data Analysis Approach

Analysis of data was done using the RII (Relative Importance Index) technique, based on the following simple but robust formulae (Lim & Alum, 1995; Enshssi *et al*, 2007; Jarkas & Bitar, 2012; Hickson & Ellis, 2014; Hafez *et al*, 2014):

$$RII(\%) = [\frac{(5n_5 + 4n_4 + 3n_3 + 2n_2 + n_1)}{5(n_5 + n_4 + n_3 + n_2 + n_1)}] \times 100\% \dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Where n_1, n_2, n_3, n_4 and n_5 are the number of respondents who selected: (1) very weak, (2) weak, (3) fair, (4) strong and (5) very strong. The RII was used to rank the factors affecting labor productivity as perceived by respondents and thus comparative analysis is possible. According to Hickson and Ellis (2014), the RII technique is a proven system for analyzing employee satisfaction; thus making it suitable for this research. Lundby & Fenlason (2000) and Whanger (2002) assert that the RII technique can expose specific elements that contribute most to management and labour concerns and assist decision makers in allocating organizational resources.

Questionnaire Discussion

The design philosophy of the questionnaire was based on the fact that the questions had to be simple, clear and

understandable for the respondents and at the same time be easily interpreted by the researcher. Factors affecting construction labour productivity were derived from both empirical and theoretical literature reviewed. The questionnaire had three parts that allowed the study to extract relevant and useful information to answer research questions. Section A had twenty-two pre-selected, closed-ended (structured) questions; these are the factors which were identified from literature review and categorized into four groups namely management, manpower, incentives and environmental. The questions in this section were measured using a simple ordinal scale based on a 5-point Likert scale comprising of ratings from 1 to 5; 1 indicates the least impact while 5 indicates the greatest impact. The respondents were asked to tell the extent to which a particular factor affected labour productivity in their organization. Section B had four open-ended (un-structured) questions which were designed in a special way so as to capture "other" factors or the so-called omitted variables, the ones that were not identified by the researcher but still exist to affect labour productivity. Section C had the demographics of the respondents such as age, sex, education, work experience and profession, whose primary purpose was to describe the respondents to effectively ensure reliability and strengthen research results.

V. DATA PRESENTATION AND INTERPRETATION
Table 1. Descriptive Statistics

Group of Factors	No. of factors	No. of factors with RII › 50%	Mean RII	Standard deviation	Minimum RII	Maximum RII	Range [Max-Min]
Management	12	8	55.3	16.26716	30.8	84.4	53.6
Manpower	5	2	48.3	21.84381	28.4	75.2	46.8
Incentive	3	2	57.5	24.68468	36.8	84.8	48
Environmental	2	1	54.6	9.33381	48	61.2	13.2
Overall	-	-	**53.925**	**18.032365**	**36**	**76.4**	**40.4**

Table 1 above shows various statistics measures of the Relative Importance Index (RII). The management group which consisted of 12 factors, had the highest number of factors whilst the environmental category consisted of only 2 factors. In the management group, the number of factors with RII › 50% was 8, while the manpower and the incentives groups each had 2 factors that had RII › 50%. The environmental category only had 1 factor that scored above 50%. The mean RII for incentive factors is 57.5%, indicating that these are the most critical factors amongst the four categories, followed by the management factors with an average RII of 55.3%. Environmental factors have an average RII of 54.6%, while manpower factors have an average RII of 48.3% showing a relatively lesser importance in terms of their overall effect on construction labour productivity in Zimbabwe. The table above shows that there is more variation amongst the incentive factors category as shown by the standard deviation of 24.68468% and range of 48%, while environmental factors exhibit the least variation, with standard deviation of 9.33381% and range of 13.2%. Overall variability is shown by a standard deviation of approximately 18% and a RII range of approximately 40%.

The distribution of the factors affecting construction labour productivity in Zimbabwe is shown below:

Figure 3:The 5-Number Summary showing the distribution of the RII
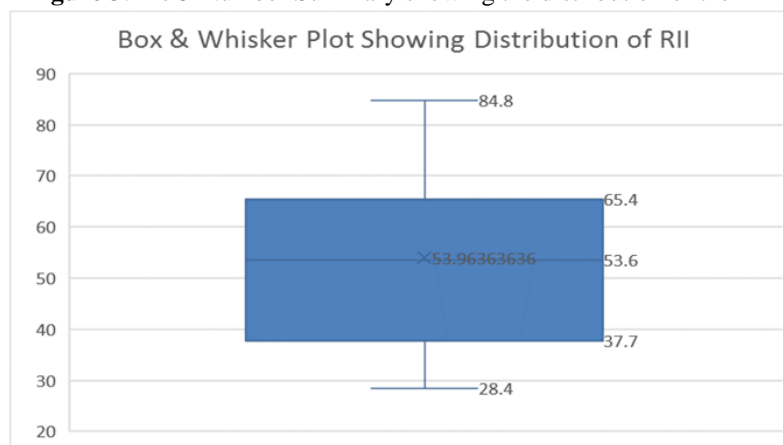
Figure 3above is a Box & Whisker Plot (also known as the 5-number summary) showing how the RII is distributed for the various pre-selected factors on labour productivity. It is also important to note that the overall mean RII is 53.96363636%, indicating that on average, all the ranked factors are generally important and should be equally addressed. The minimum RII is 28.4% and the maximum RII is 84.8% as shown above. However, it follows that the factor that scored the maximum RII (that is: late or non-payment of wages and salaries) is the

most critical one as ranked by the respondents while the one that scored the minimum RII (that is, personal problems) bears relatively lesser importance although it still exist to affect construction labour productivity. Q_1 is 37.7, Q_2 (the median) is 53.6 and Q_3 is 65.4. Since $[(Q_3 - Q_2) < (Q_2 - Q_1)]$, it implies that the distribution of the RII is negatively skewed. The wider lower whisker as shown by negative skewness implies that respondents' views are varied amongst the most negative quartile group and very similar for the least negative quartile group. However, since the box is relatively short, it suggests that the overall respondents have a high level of agreement with each other concerning the main factors affecting construction labour productivity in Zimbabwe.

Table 2 below shows the calculation of outlier boundaries. Any value that lies more than one and a half times the length of the box from either end of the box is referred to as an outlier. Hence, the table below is based on Figure 2 above and serves the purpose of checking for outliers.

Table 2: Calculation of Outlier Boundaries

	Formula	**Workings**	**Statistics**
Interquartile range (IQR)	$Q_3 - Q_1$	65.4-37.7	27.7
Outlier Lower Boundary	$Q_1 - 1.5 \times IQR$	37.7-1.5(27.7)	-3.85
Outlier Upper Boundary	$Q_3 + 1.5 \times IQR$	65.4+1.5(27.7)	106.95

From the table above any RII that lies below the lower boundary (-3.85) and above the upper boundary (106.96) as calculated is an outlier. Therefore, the research has found no outliers in the RII statistics, since the minimum is 28.4% and the maximum is 84.8% and both lie between the outlier boundaries. This implies that the research results are all considered for policy conclusions as they show synonymous characteristics.

VI. RESULTSAND DISCUSION

The analysis of the results was based on the RII index of the variables. The RII indices identify the relative importance attached to the factors by the respondents. The overall factors are classified under four major categories as follows: twelve (12) under the "Management category", five (5) under the "Manpower category", three (3) under the "Incentive category" and lastly two (2) under the "Environmental category".

However, some factors were of little concern to the respondents and this indicates that they rarely affect construction labour productivity. The RII indices for such factors fall below 50% (or 0.5) and these are whether and season changes, job enlargement, decentralization and delegation, absenteeism, strong trade unionism, overtime, misunderstanding between employees, project objective is not well defined, and personal problems.

Below is a discussion of the thirteen (13) most important factors affecting construction labour productivity in Zimbabwe:

Management Category:

Table 3:RII ranking of management factors

Factors affecting labour productivity	RII index	Rank
Suitability or adequacy of capital (plant & equipment etc.)	84.4	1
Non-payment to suppliers causing stoppage of materials delivery to sites and or shortage of materials	78.4	2
Incomplete drawings& late issuance of construction drawings by consultants	64.4	3
Availability of information technology (IT)	62.0	4
Supervisory incompetence	58.4	5
Shortage of water and power supply	58.0	6
Performance appraisal	55.2	7
Participative management	52.0	8
Job enlargement	47.2	9
Decentralization & delegation	38.8	10
Overtime	34.4	11
Project objective is not well defined	30.8	12

Suitability/adequacy of capital (plant & equipment): The results show that this is an important factor that affects productivity in the construction industry in Zimbabwe. This factor ranked 1st in the management category and ranked 2nd in the overall ranking with an RII index of 84.4%. Without enough plant and equipment workers cannot perform their duties properly. It is also important to note that available plant and equipment has to be suitable as well. This is another important aspect that needs to be considered as well. This is consistent with the findings made by Makulsawatudon *et al* (2004) and Chigara & Moyo (2014). These results reaffirm the observation by the former President of CIFOZ, noted by Nyakazeya (2012); that most of the plant and equipment owned by construction companies is antiquated such that they cannot perform tasks efficiently.

Non-payment to suppliers causing stoppage of construction delivery to sites and or shortage of materials: Suppliers are an important stakeholder of the construction sector. This factor ranked 2nd in the management category and ranked 3rd in the overall ranking with an RII index of 78.4%. It is important to make sure those suppliers are paid up in time to ensure efficient and timely deliveries to construction sites. This factor was also found to be very significant in affecting construction labour productivity. These results are also similar to previous findings by Abdul Kadir *et al* (2005). Therefore as evident in this research, suppliers should be paid in time; this apparently incentivizes them to deliver supplies in time. Workers will also work without delays if such materials are supplied in time.

Incomplete drawings & late issuance of construction drawings by consultants: This factor also affects labour productivity as it also causes a lot of inconveniences and the need for re-work. It ranked 3rd in the management category and ranked 6th in the overall ranking, with an RII index of 64.4%. The results are similar to the findings of Makulsawatudon *et al* (2004) and Abdul Kadir *et al* (2005). Incomplete drawings & late issuance of construction drawings by consultants directly causes unnecessary delays in construction and negatively impacts on labour productivity.

Availability of information technology (IT): This factor ranked 4th in the management category and ranked 7th in the overall ranking, with an RII index of 62.0%. Most construction companies in Zimbabwe use old and outdated machinery. Very few construction companies in Zimbabwe nowadays use technologically advanced machinery. However, information technology in the construction industry also helps to improve productivity.

Supervisory Incompetence: This factor ranked 5th in the management category and ranked 9th in the overall ranking with an RII index of 58.4%. Incompetent supervisors are a big blow to labour productivity. In Zimbabwe, a foreman or supervisor is a tradesman who normally lacks Human Resources (HR), Business Management (BM) and or project management skills. These results are consistent with the findings of Chigara & Moyo (2014).

Shortage of water and or power supply: The research also found out that shortage of water and or power supply is also a matter of concern in the construction industry. This factor ranked 6th in the management category and ranked 10th in the overall ranking. This factor had an RII index of 58.0%. Zimbabwe is well known for power (electricity) cuts and water shortages and this has always been a big blow to some construction companies. However, some companies now rely on **Generators** for power supply (in cases where they experience power-cuts).

Performance appraisals: This is another important factor that affects construction labour productivity in Zimbabwe. It ranked 7th in the management category and ranked 11th in the overall ranking with an RII index recorded at 55.2%. This is acceptable because construction business' success also heavily depends on the performance of construction workers. Therefore a job appraisal system is necessary to assess the performance of each worker. A periodic appraisal lets the employee know what he or she is doing and what needs improvement.

Participative management: This factor ranked 8th in the management category and ranked 12th in the overall ranking. Participative management is a leadership or management style that enables increased employees' say or involvement in decision making processes, primarily to enhance their feeling of belonging or association. With participative management, the employees now assume responsibility and take charge. There is lesser delegation or supervision from the manager, supervisor or foreman. Working hours may get stretched on their own without any compulsion or force from the management. All this leads to increased productivity. However, as shown by the RII index of 52.0% (or 0.520); in the construction industry, participative management has a relatively lesser significance (although it is still important) probably because it apparently leads to very slow decision making processes. On the part of management, they also fear that their powers could be diluted and also fear that some critical information could leak if everyone was involved in the decision making process.

Manpower category:

Table 4: RII ranking of manpower factors

Factors affecting labour productivity	RII index	Rank
Availability of experienced labour	75.2	1
Education & training	68.4	2
Absenteeism	38.0	3
Misunderstanding between employees	31.6	4
Personal problems	28.4	5

Availability of experienced labour: This factor ranked 1st amongst the manpower factors and but ranked 4th on the overall ranking, with an RII index of 75.2%. Lack of experienced labour has a great influence on productivity. This result is consistent with the findings by Enshassi *et al*, (2007); Chigara *et al* (2013); Durdyev *et al*, (2013) and Chigara & Moyo (2014). Apparently, this is acceptable because experience improves both the intellectual and physical abilities of work force which, consequently, increases labour productivity.

Education and training: This research also found out that education and training is an important factor that significantly affects the construction labour productivity. This factor ranked 2nd amongst the manpower category and ranked 5th in the overall ranking, with an RII index of 68.4%. The Human Capital theory identifies the importance of training and education in relation to productivity of labour. This research found out that educated and sufficiently trained workers exhibit higher productivity as compared to their un-educated and un-trained counterparts. This is consistent with the findings of Alinaitwe *et al* (2007), Durdyev & Mbachu (2011), El gohary & Aziz (2014) and Chigara & Moyo (2014). Lack of highly skilled and trained workers in the construction industry in Zimbabwe could be attributed to high capital flight experienced in the country owing to economic-hardships. This has seen more workers crossing borders in search of greener pastures.

Incentive Category:

Table 5: RII ranking of incentive factors

Factors affecting labour productivity	RII index	Rank
Late & or non-payment of wages & salaries	84.8	1
Employment benefits	50.8	2
Strong trade unionism	36.8	3

Late and non-payment of wages & salaries: This factor ranked 1st both in the incentives category and in the overall ranking with an RII index of 84.8%. This shows that wages and salaries are a most significant determinant of labour productivity. Workers need to be paid in time. These results are consistent with the findings of Chigara & Moyo (2014). However, in as much as wages and salaries are concerned; it should be noted that economic theory (the special case of the Cobb-Douglas technology) indicates that the wage paid by a competitive firm must rise at the same rate as the rise in productivity.

Employment benefits: This factor ranked 2nd in the incentive category but ranked 13th in the overall ranking, which effectively tells us that it is the least important factor amongst the thirteen (13) factors found to be the main factors affecting construction labour productivity in Zimbabwe. Employment benefits for workers in the construction industry include subsistence, housing and transport allowances. However, these have shown to have the least impact on labour productivity, recording an RII index of 50.8%.

Environmental Category:

Table 6: RII ranking of environmental factors

Factors affecting labour productivity	RII index	Rank
Health & Safety	61.2	1
Weather & season changes	48.0	2

Health & Safety at work: This is another critical factor as shown by the research. It ranked 1st in the environmental category and ranked 8th in the overall ranking. This factor had an RII index of 61.2%. Employees need a safe place to work; that they are safe is a critical determinant of their productivity. Health at the same is also equally important as explained in the Grossman Demand for Health Model; that healthier workers are more likely to be productive than their unhealthier counterparts. According to ZimStats (2013); the Building and Construction industry experienced 119 332 incidences of injuries and 307 fatalities in 2013. These are alarming statistics not just numbers.

Other factors that were also found to exist and affect construction labour productivity as derived from un-structured questions:
Variation in cost of materials: this was also found to be an important factor that affects construction labour productivity in Zimbabwe. The cost of materials as at the time of contract award may vary in the course of the construction, in most cases there is a time-lag between the time of contract award and the time of construction activity. Atomen *et al* (2015) argue that this experience is very often encountered in developing economies, of which Zimbabwe is not an exception. Variation in cost of materials can be attributed to the interaction between the forces of demand and supply of construction materials which apparently affects the prices of construction materials.

Material storage location: This was also found to be an important factor that also exists to affect productivity. According to Sanders and Thomas (1991), the size and the organization of the materials' storage location has a significant impact on construction labour productivity. This result is acceptable because workers need more time to bring required materials from unsuitable storage locations, negatively affecting productivity. In Zimbabwe, some construction activities normally get disrupted or delayed due to unsuitable material storage location.The overall ranking of the twenty-two pre-selected factors is summarized in the table below. The top thirteen (13) most important factors that mainly affect construction labor productivity in Zimbabwe are as follows: (1) late and or non-payment of wages and salaries, (2) suitability and or adequacy of capital, (3) non-payment to suppliers causing stoppage of materials delivery to sites and or shortage of materials (4) availability of experienced labour, (5) education and training, (6) incomplete drawings and or late issuance of construction drawings by consultants (7) availability of information technology (IT), (8) health & safety, (9) supervisory incompetence, (10) shortage of water and or power supply, (11) performance appraisals (12) participative management and (13)employment benefits.

Table 6. Overall ranking of factors affecting labor productivity

Factors affecting labour productivity	Category	RII index	Rank
Late or non-payment of wages and salaries	Incentive	84.8	1
Suitability or adequacy of capital (plant & equipment etc.)	Management	84.4	2
Non-payment to suppliers causing stoppage of materials delivery to sites and or shortage of materials	Management	78.4	3
Availability of experienced labour	Manpower	75.2	4
Education and Training	Manpower	68.4	5
Incomplete drawing & late issuance of construction drawings by consultants	Management	64.4	6
Availability of information technology (IT)	Management	62.0	7
Health & Safety	Environmental	61.2	8
Supervisory incompetence	Management	58.4	9
Shortage of water & power supply	Management	58.0	10
Performance appraisal	Management	55.2	11
Participative management	Management	52.0	12
Employment benefits	Incentive	50.8	13
Weather & season changes	Environmental	48.0	14
Job enlargement	Management	47.2	15
Decentralization & delegation	Management	38.8	16
Absenteeism	Manpower	38.0	17
Strong trade unionism	Incentive	36.8	18
Overtime	Management	34.4	19
Misunderstanding between employees	Manpower	31.6	20
Project objective is not well defined	Management	30.8	21
Personal problems	Manpower	28.4	22

VII. RECOMMENDATIONS

The research recommends the following:

1) Construction companies should pay salaries and wages in time. Performance appraisal of workers, together with financial incentives in the form of best employee of the year should be implemented to create competition among the employees, thus achieving better productivity. In the same vain, participative management style is also recommendable to improve labour productivity by increasing workers' involvement in decision making.

2) Construction companies should retain experienced labour through offering better salaries and wages as well as packages and/or benefits. It is recommended however, that construction companies should also invest in training and development of its staff to improve labour productivity. Supervisors who are professional tradesmen should be trained in other areas such as human resources and administration to improve their competence.

3) A detailed schedule of material supply should be provided by the contractors and should contain the time required to supply materials and the availability of the required materials in time to avoid stoppage and or delay of materials delivery. Payment to suppliers ought to be done in time as well. Extra attention is required on quality of construction equipment, materials and tools used because using suitable technologically advanced equipment, materials and tools reduces both the time taken to finish the work and wastage of materials; and it also has a positive effect on labor productivity.

4) To achieve desired results, time required to make corrections in drawings and specifications should be estimated and scheduled without affecting the completion and or commencement of construction work.

5) Finally, it is also recommended that construction companies should make sure they observe and maintain

standard work-place health and safety practices in line with local and international regulations.

VIII.   CONCLUSION

In today's world, the construction industry is rated as one of the strategic industry especially in developing countries like Zimbabwe. It apparently promotes the infrastructure required in socioeconomic development which is also a contributor to the overall economic growth. Study and knowledge of construction productivity are very important because they influence the economics of the construction industry. Therefore, prior knowledge of labor productivity during construction can save time and money. The study fills a gap in knowledge of factors affecting labour productivity in Zimbabwe, which can be used by industry practitioners to develop a wider and deeper perspective of the factors influencing the efficiency of operatives; and provide guidance to construction managers for efficient utilization of the labour force, thereby assisting in materializing a reasonable level of competitiveness and cost effective operation. However, it is important to note that those factors that scored below 50% should as well be addressed though greater effort should be directed to the most ranked factors. No undermining should be done to empirically determined factors.

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APPENDIX

Questionnaire

Section A: Closed-ended questions

Please indicate to what extent each of the following factors affects labour productivity at your organisation *(by ticking in the box below 1/2/3/4/5).*

Data Measurement **Key:** 1-Very Weak; 2-Weak; 3-Fair; 4-Strong; 5-Very Strong

Number	Factors affecting labour productivity	1	2	3	4	5
	Management Category					
1	Participative management					
2	Performance appraisals					
3	Job enlargement					
4	Decentralisation & Delegation					
5	Suitability/adequacy of capital (plant & equipment etc.)					
6	Availability of information technology (IT)					
7	Incomplete drawings & late issuance of construction drawings by consultants					
8	Non-payment to suppliers causing stoppage of materials delivery to sites and or shortage of materials					
9	Supervisory incompetence					
10	Overtime (including working during holidays)					
11	Shortage of water and or power supply					
12	Project object is not well defined					
	Manpower category					
13	Absenteeism					
14	Education and training					
15	Availability of experienced labour					
16	Personal problems, for example stress, alcoholism and so on					
17	Misunderstanding between employees					
	Incentives Category					
18	Strong trade unionism (ability to bargain for higher wages and better working conditions)					
19	Availability of employment benefits					
20	Late and non-payment of wages and salaries					
	Environmental Category					
21	Health and Safety at work					
22	Weather and season changes					

Section B: Open-ended questions

1) How would you define labour productivity *in construction industry?*..

2) What are the factors affecting labour productivity at this construction company?..

3) Amongst the factors you mentioned above, which ones are the most important and why?...

4) Given the responses you provided above, how can labour productivity be improved?...

Section C: Demographics

*Please **tick** the applicable*

Sex:................................Male/Female;

Age:………………...……18-25/26-35/36-50/above 50

Education:………………O' Level/ A' Level/ Diploma/ Degree/ Post Graduate

Work Experience:......................student/0-5 years/6-10 years/10-15 years/above 15 years

You are allowed to tick more than one profession

Profession:
❖ Carpenter
❖ Builder/Bricklayer
❖ Earth-moving & Construction equipment Operator
❖ Electrician
❖ Engineer
❖ Painter
❖ Tiler
❖ Plumber
❖ Foreman/Supervisor
❖ Manager
❖ Other (*specify*)…………………………………………..