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Motivational Factors Affecting Construction Labor Productivity: A Review

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Abstract: Research on motivational factors affecting construction labor productivity (CLP) has attracted numerous researchers worldwide many years so far. This study aims to review studies on motivational factors affecting CLP from the outcomes of previous studies. Based on a comprehensive review, publications on this domain were analyzed in terms of geographical distribution, adopted research methods, common motivational factors, and knowledge gaps. The findings indicated that the majority of studies were carried out in the Asia continent, followed by Europe, Africa, and America. Also, almost studies adopted methods of empirical research for identifying and evaluating of motivational factors with a prevalent procedure that includes five stages, namely, identifying motivational factors based on a review of existing literature; pilot study; data collection; data analysis; and concluding critical motivational factors. Additionally, the results also revealed that the mostly identified motivational factors contain rewards; good relationship; promotion opportunities; job security; good supervision; the amount of salary; and a good work environment. It is recommended that engineering managers, project managers, employers should use the findings of this study to make policies or decisions to ensure effective management and improve construction workforce productivity.

Keywords: Motivational Factor; Labor Productivity; Construction Industry; Literature Review

1. Introduction

The construction industry is one of the largest and most resource-consuming industries in the world, accounting for 50% of raw materials and 40% of global energy consumption (Corporation, 2018; Hazeltine, 1976). Besides, the construction sector value contributes from 6% to 9% of an economy's gross domestic product (GDP) (Arditi & Mochtar, 2000; Chitkara, 1998). However, in comparison with other industries, the construction industry seems to lag in the using and adoption the technology advances and employs numerous unskilled construction workers, hence, productivity in the construction primarily depends on the workforce's effort and performance (Haas *et al.*, 2008; Jarkas, 2010; Ng *et al.*, 2004). Consequently, in many countries, however, the construction sector is facing one of the most problems that low-level labor productivity (Ayele & Fayek, 2019; Egan, 1998; Jarkas & Bitar, 2012; Lim & Alum, 1995; Segerstedt *et al.*, 2010; Timmer *et al.*, 2010; Tookey, 2011). This is a primary cause sequence that decreases GDP, increases inflationary pressure, social conflicts, and mutual suspicion to the countries' economy (Dixit *et al.*, 2017; Drucker, 1993; Hamza *et al.*, 2019; Shoar & Banaitis, 2019). Laborers' motivation as a

determinant may lead to stimulating construction productivity enhancement (Barg *et al.*, 2014; Borcherding, 1976; Hewage & Ruwanpura, 2006; Laufer & Borcherding, 1981; Maloney & McFillen, 1987; Schrader, 1972). The workforce in construction projects is one of the difficult factors to supervise, manage, and control. Therefore, it is critically important to determine the motivational factors influencing CLP (Hamza *et al.*, 2019; Kazaz & Acıkara, 2015). Understanding the motivational factors influencing CLP may lead to the development of strategies to reduce inefficiencies and improve construction project performance through more effective construction workforce management (Ailabouni *et al.*, 2009; Hamza *et al.*, 2019; Robles *et al.*, 2014). Therefore, a comprehensive and in-depth review of motivational factors impacting CLP should be conducted in order to provide an extensive picture to help researchers can focus further studies, thereby maximizing the chance for enhancement CLP.

The goal of the present study is to comprehensively review of previous studies have been conducted to identify and address motivational factors affecting labor productivity in the construction industry. To achieve this, specific objectives are as follows:

(1)   To identify a list of motivational factors influencing CLP through a review of different studies were carried out so far by using available scientific databases.

(2)   To ascertain the geographical distribution of motivational factors affecting CLP.

(3)   To determine research methodology to be adopted in studies on motivational factors affecting CLP.

(4)   To identify the most common motivational factors affecting CLP from previous studies.

(5)   To determine knowledge gaps related to studies on motivational factors affecting CLP in order to recommend suggestions or directions for further researches.

The results of this study could be referred by not only scientific researchers, who are interested in motivational factors affecting CLP but also key stakeholders of the construction projects (i.e., project managers, contractors, owners) to help them develop a deeper and wider understanding of the motivational factors influencing the productivity of the construction workforce. As a result, they can focus, acting upon, and controlling the primary motivational factors affecting CLP towards improving construction project performance and maximizing project profit.

2. Past studies

Motivation has been defined as "providing a drive to act to satisfy needs or desires" (Cox *et al.*, 2005). According to (Funso, 2016), it is a positive charge that produces motivation current that moves an individual to expend the effort that will lead to the attainment of organizational goals and meet personal needs; whereas, (Jenkins *et al.*, 1982) stated that motivation is intangible, a hypothetical construct that is used to explain human behavior. Another perspective, (Schmid & Adams, 2008) explained that motivation is commonly sourced from intrinsic or extrinsic motives. Extrinsic motivation reflects an instrumentality between the activity and some separable consequences such as tangible or verbal rewards; hence, satisfaction comes not from the activity itself but rather from the extrinsic consequences to which the activity leads. In contrast, intrinsic motivation reflects individuals doing an activity because they find it interesting and derive spontaneous satisfaction from the activity itself (Gagné & Deci, 2005).

In many years so far, research on motivation has been concerned by numerous researchers around the world. For the construction industry, various studies have been researched on motivational factors affecting CLP in order to identify, evaluate these factors, and recommend the measurements to improve labor productivity in the construction sector. To improve construction project performance, motivational factors influencing CLP should be identified and addressed appropriately (Hasan *et al.*, 2018). That is why various motivational factors were identified and assessed by many previous studies. For example, (Aghayeva & Ślusarczyk, 2019) identified 25 motivational factors affecting CLP in Azerbaijan. Accordingly, top factors were assessed impacting CLP such as amount of remuneration; high responsibility job; job security; bonuses and fringe benefits; and challenging task. In Australia, 25 motivational factors influencing CLP were determined by (Doloi, 2007); factors of job security; work appreciation and reward; work

environment; prospect of promotion; and geographical position were found as determinant factors to impact on CLP. In Malaysia, (Ohueri *et al.*, 2018) stated that effective management and supervision; financial incentives; effective management; viable construction practices; and sufficient reward system were the most motivational factors affecting CLP; whereas, factors of bonus or rewards; amount of salary; friendliness and helpfulness of the coworkers; amount of freedom in your work; and chance for getting a promotion were important factors affecting CLP in Canada. Table 1 indicates the top motivational factors affecting CLP which were ranked by different researchers.

3. Method

To comprehensively review and analyze and the findings of previous studies in a research area or a particular topic, the methodological analysis of publications in scientific journals is very important (Tsai & Lydia Wen, 2005). The present study carries out a review related papers based on an examination literature on the identification of motivational factors influencing CLP. It synthesizes and assesses the current state of existing papers to identify patterns and trends in the existing research body and recommends new future studies (Hasan *et al.*, 2018).

To begin with, academic journals are sought with publications on motivational factors impacting CLP. The list of previous studies was identified by the use of a powerful "Scopus" search engine for a comprehensive on the specific area (Osei-Kyei & Chan, 2015; Van & Quoc, 2021). This is because "Scopus" covers most article databases in numerous different scientific areas such as management, engineering, accounting, and business (Hong & Chan, 2014). Besides, "Scopus" was considered in terms of its accuracy and coverage better than other search engines such as Google Scholar, PubMed, or Web of Science (Falagas *et al.*, 2008). In addition, the Scopus search engine has been employed in similar research of literature review in the field of construction management (Hong & Chan, 2014; Van Tam, 2021; Yuan & Shen, 2011).

In order to critically analyze and facilitate a clear representation of the trend of motivational factors affecting CLP research, a comprehensive search was conducted under the "title/abstract/keyword" fields of the search engine "Scopus". The search keywords involved "motivational factors", and "motivational factors affecting", which were limited to the area of the CLP by the use of keyword "labor productivity", "construction labor productivity", and "construction productivity". Studies include these specific terms in the title, abstract, or keywords that were considered to meet the requirements of this study. The full search code is as follows:

TITLE-ABS-KEY ("motivational factors" OR "motivational factors affecting" AND TITLE-ABS-KEY ("labor productivity" OR "construction labor productivity" OR "construction productivity") AND DOCTYPE (ar OR re) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "j")).

In this regard, all journals adopted are prominent "construction research" journals. In these scientific journals, this study carefully researched through the titles of all the articles appearing in each issue of all the volumes looking for any papers which were to be concerned with "motivational factors" and "construction labor productivity". Next, all publications in journals, which were published under the broad groups of "editorial", "book review", "articles in press", "letter to the editor", "closures and discussion", "introduction", and "briefing sheet", were removed from the analysis (Ke *et al.*, 2009; Osei-Kyei & Chan, 2015). In addition, the abstracts of publications that had some relevance to "motivational factors" were examined closely and the ones which had the keyword "construction labor productivity" in the abstract were considered for this study (Hamza *et al.*, 2019). Consequently, a total of 27 publications on this domain were considered for further analysis. Figure 1 illustrates the research framework for this study.

Following the compilation of selected papers, this study analyzed the data in order to identify: Geographical distribution of motivational factors affecting CLP; research methodologies to be adopted in studies on motivational factors affecting CLP; the most common motivational factors affecting CLP and recommendations for further studies.

Table 1. Summary of previous studies on motivational factors affecting construction labor productivity

Study	Region	Total factors identified	Top motivational factors affecting construction labor productivity
Hewage (2007)	Canada	23	(1) Bonus or rewards; (2) Amount of salary; (3) Friendliness and helpfulness of the coworkers; (4) Amount of freedom in your work; (5) Chance for getting a promotion
Doloi (2007)	Australia	25	(1) Job security; (2) Work appreciation and reward; (3) Work environment; (4) Prospect of promotion; (5) Geographical position
Dwivedula and Bredillet (2010)	Multi-nation	18	(1) Employee development; (2) Work climate; (3) Perceived equity; (4) Work objectivity; (5) job security
Funso *et al.* (2016b; 2016a)	Nigeria	16	(1) Job security; (2) Good salary; (3) Compliance with safety; (4) Appreciation of effort; (5) Bonus
Jarkas *et al.* (2014)	Qatar	38	(1) Lack of financial incentive schemes; (3) Slow decision-making process by owners; (3) Remuneration scale; (4) Delay in responding to requests for information; (5) Shortage of skilled labor force
Al-Abbadi and Agyekum-Mensah (2019)	Jordan	16	(1) Personal growth/career improvement; (2) Pay on time; (3) Decision-making ability; (4) Decent and respectful job; (5) Rewards
Olomolaiye (1990)	UK	28	(1) Good relations with mates; (2) Good safety program; (3) The work itself; (4) Overtime; (5) Level of pay
Shin *et al.* (2013)	Korea	25	(1) Economical factors; (2) Social factors; (3) Psychological factors
Ng *et al.* (2004)	Hong Kong	7	(1) Rework; (2) Overcrowded work areas; (3) Crew interfacing; (4) Tool availability; (5) Inspection delays
Khan *et al.* (2011)	Pakistan	20	(1) Free lunch; (2) Amount of pay/wages (3) Bonus on Eid; (4) On-time payment; (5) Incentive payments and financial rewards
Kazaz *et al.* (2008)	Turkey	37	(1) Quality of site management; (2) Material management; (3) On-time payment; (4) Systematic flow of work; (5) Supervision
Parkin *et al.* (2009)	Turkey	18	(1) Money; (2) Relationships; (3) Enjoyment; (4) Home life; (5) Getting a poor quality meal
Zakeri *et al.* (1997)	Iran	20	(1) Weather temperature; (2) Lack of working area; (3) Skillfulness; (4) Average workweek (hour); (5) Project management efficiency
Ghoddousi *et al.* (2015)	Iran	12	(1) Fairness of pay; (2) Incentives and financial rewards; (3) On-time payment; (4) Good working facilities; (5) Safety and health at work
Nasirzadeh and Nojedehi (2013)	Iran	6	(1) Empowerment; (2) Delay in salary payment; (3) Job security; (4) The proportion of labor's salary and responsibility; (5) interpersonal interaction
Momade and Hainin (2019)	Qatar	10	(1) Achievement; (2) Proper recognition and rewards, (3) Poor work conditions; (4) Poor administration policy; (5) Poor work relationship

Table 1. Summary of previous studies on motivational factors affecting construction labor productivity   (continued)

Study	Region	Total factors identified	Top motivational factors affecting construction labor productivity
Gunduz and Abdi (2020)	Qatar	19	(1) Sharing specific design solutions with partners when needed; (2) Sharing technical solutions in work implementation; (3) Share experience in defining the scope of works and specifications to subcontractors; (4) Having better utilization of construction equipment and machinery; (5) Enhance health, security, safety and environmental control
Ohueri *et al.* (2018)	Malaysia	23	(1) Effective management and supervision; (2) Financial incentives; (3) Effective management; (4) Viable construction practices; (5) Sufficient reward system
Jarkas and Radosavljevic (2013)	Kuwait	23	(1) Payment delay; (2) Rework; (3) Lack of financial incentive scheme; (4) The extent of change orders during execution; (5) Incompetent Supervisors
Shroff and Sridhar (2011)	India	19	(1) Job training; (2) Good salary; (3) Recognition from peers, (3) Growth; (4) Challenging task; (5) Monetary benefits
Ugulu *et al.* (2016)	South Africa	25	(1) Days off; (2) Financial Incentives; (3) Skills enhancement; (4) Salaries paid on time; (5) Job enlargement
Enshassi *et al.* (2007)	Palestine	6	(1) Payment delay; (2) Lack of financial motivation system; (3) Lack of labor recognition programs, (4) Non-provision of transport means; (5) Lack of places for eating and relaxation
Rivas *et al.* (2011)	Chile	41	(1) Materials; (2) Rework; (3) Equipment and trucks; (4) Tools; (5) Interference
McFillen and Maloney (1988)	USA	5	(1) Feeling of accomplishment; (2) Opportunities; (3) Peer rewards; (5) Feedback; (5) Supervisor rewards
Ruthankoon and Ogunlana (2003)	Thailand	18	(1) Achievement; (2) Recognition; (3) Work if self; (4) Responsibility; (5) Advancement
Aghayeva and Ślusarczyk (2019)	Azerbaijan	25	(1) Amount of remuneration; (2) High responsibility job; (3) Job security; (4) Bonuses and fringe benefits; (5) Challenging task
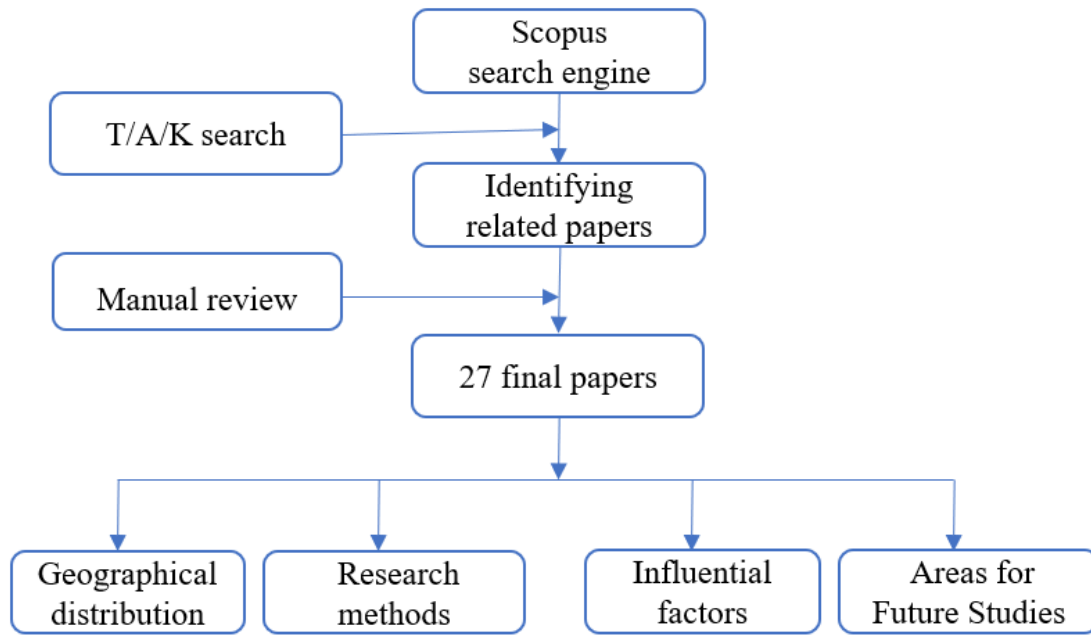
NOTE: T/A/K-title/ abstract/ keywords

Figure 1. Research framework for the study

4. Findings

4.1 Regional distribution of motivational factors affecting construction labor productivity studies

Table 2 provides the geographical spread of the previous studies over different continents. It can be noted that the majority of studies were carried out in the Asian nations (59%) followed by European nations (19%), Africa (11%), America (7%), and Australia Pacific (4%). Besides, the analysis results indicated that Qatar (3), Iran (3), Turkey (2), and Nigeria (2) have a higher number of publications to contribute to studying motivational factors influencing CLP.

Concerning the geographical areas, the majority of the researchers in Africa have revealed that: Job security (Funso, 2016; Funso *et al.*, 2016a, 2016b); Days off (Ugulu *et al.*, 2016); Good salary (Funso *et al.*, 2016b); Financial Incentives (Funso, 2016; Ugulu *et al.*, 2016); Compliance with safety (Funso *et al.*, 2016a) and Skills enhancement (Ugulu *et al.*, 2016) are the critical motivational factors impacting labor productivity in the construction sector, whereas, (Doloi, 2007) stated that top five motivational factors influencing CLP in Australia Pacific that are: Job security; Work appreciation and reward; Work environment, employer's recognition; Prospect of promotion; Geographical position.

In North America countries, the findings from studies indicated that top motivational factors influencing CLP as follows: Bonus or rewards (Kasun Neranja Hewage, 2007; Hewage & Ruwanpura, 2006; McFillen & Maloney, 1988); Working conditions (Hewage, 2007; Hewage & Ruwanpura, 2006); Amount of salary (Hewage, 2007); Feeling of accomplishment (McFillen & Maloney, 1988); Management and supervision (Hewage, 2007; McFillen & Maloney, 1988). However, in Europe, the numerous researchers explained that Good relations (Aghayeva & Ślusarczyk, 2019; Olomolaiye, 1990; Parkin *et al.*, 2009); Material management (Kazaz *et al.*, 2008; Rivas *et al.*, 2011); Quality of site management (Kazaz *et al.*, 2008; Rivas *et al.*, 2011); Level of payment (Aghayeva & Ślusarczyk, 2019; Kazaz *et al.*, 2008; Olomolaiye, 1990; Parkin *et al.*, 2009) are the main motivational factors impacting CLP.

In the Asia continent, numerous researchers stated that the primary motivational factors affecting CLP include: Good salary (Al-Abbadi & Agyekum-Mensah, 2019; Ghoddousi *et al.*, 2015; Jarkas & Radosavljevic, 2013; Jarkas *et al.*, 2014; Khan *et al.*, 2011; Nasirzadeh & Nojedehi, 2013; Ohueri *et al.*, 2018; Shroff & Sridhar, 2011); Achievement (Al-Abbadi & Agyekum-Mensah, 2019; Hai & Van Tam, 2019; Momade & Hainin, 2019; Nasirzadeh & Nojedehi, 2013; Ruthankoon & Ogunlana, 2003; Shroff & Sridhar, 2011); Rewards (Al-Abbadi & Agyekum-Mensah, 2019;

Table 2. Identification of the motivational factors related to CLP in different regions

Number of studies	Regions	Continent	Percentage
3/27	Qatar	Asia	59%
1/27	Jordan		
1/27	Korea		
1/27	Hong Kong		
1/27	Pakistan		
3/27	Iran		
1/27	Malaysia		
1/27	Kuwait		
1/27	India		
1/27	Vietnam		
1/27	Palestine		
1/27	Thailand		
1/27	Canada	America	7%
1/27	USA		
1/27	Australia	Australia Pacific	4%
1/27	Chile	Europe	19%
2/27	Turkey		
1/27	UK		
1/27	Azerbaijan		
1/27	South Africa	Africa	11%

Ghoddousi *et al.*, 2015; Jarkas & Radosavljevic, 2013; Khan *et al.*, 2011; Momade & Hainin, 2019; Ohueri *et al.*, 2018; Shin, Kim *et al.*, 2013; Van Tam, *et al.*, 2018); Recognition (Al-Abbadi & Agyekum-Mensah, 2019; Enshassi *et al.*, 2007; Momade & Hainin, 2019; Nasirzadeh & Nojedehi, 2013; Ruthankoon & Ogunlana, 2003; Shroff & Sridhar, 2011); Supervision (Jarkas & Radosavljevic, 2013; Ng *et al.*, 2004; Ohueri *et al.*, 2018).

4.2 Research methodology adopted in studies on motivational factors affecting construction labor productivity

The findings of the study was conducted by (Fellows & Liu, 2015) revealed that there are 5 research approaches including case study, survey, experiment, action research, and ethnographic research. The finding also explained that studies in the construction industry were adopted by case study, survey, and experiment methods. Of which, the experiment method on critical factors influencing CLP would take a long time to give meaningful outcomes and thereby, would be higher costs (Hasan *et al.*, 2018). In addition, the study of (Alinaitwe *et al.*, 2007) indicated that the approach of case study only provides results for a specific project, it would not provide generalizable outcomes as different projects face different issues. Therefore, the survey approach through a structured questionnaire is mainly used in CLP studies as the most preferred data collection tool.

By considering the research approaches of previous studies, the author realized that almost studies adopted the methods of empirical research for identifying and evaluating of motivational factors impacting CLP with a prevalent procedure includes steps as follows (Hamza *et al.*, 2019) identifying motivational factors affecting CLP based on a review of existing literature; pilot study; data collection; data analysis; and concluding critical motivational factors influencing CLP. This process is illustrated in Figure 2, and is explained in the following steps.

Step 1: Identifying motivational factors – The list of motivational factors affecting labor productivity in the construction industry was identified by a comprehensive review previous studies related on the topic area. These factors were categorized into different groups such as motivators or demotivators factors.

Step 2: Pilot study – After motivational factors were listed and grouped by researchers, a questionnaire survey was designed. Before distributing the questionnaire, a pilot study was required to verify the questionnaire and ensure that the information returned by respondents was relevant to the study's objectives (Dwivedula & Bredillet, 2010; Hewage & Ruwanpura, 2006; Jarkas et al.,
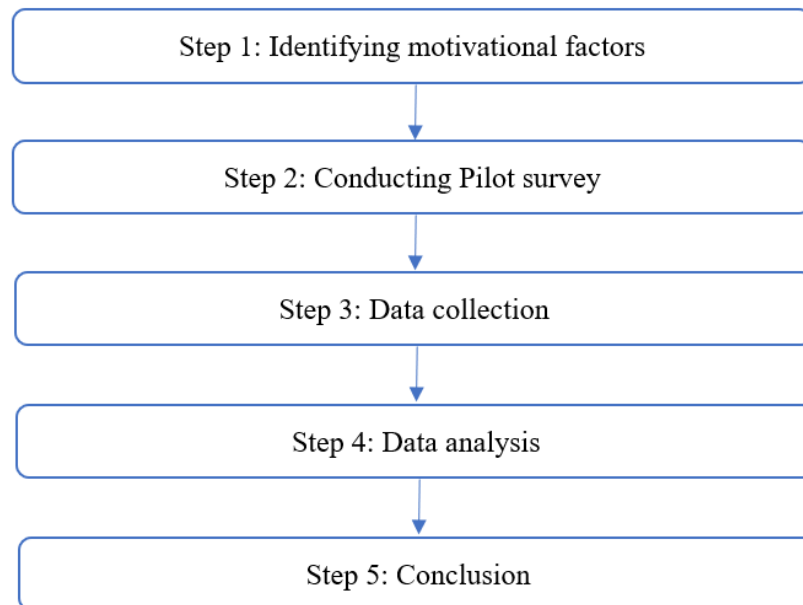
Figure 2. The common process of research method in this domain

2014; Shroff & Sridhar, 2011; Van Tam *et al.*, 2021). This stage was completed by distributing the questionnaire to experts with many years of experience and in-depth knowledge of the subject. They evaluated the validity of the questionnaire content, commented on the readability of the linguistics, and added additional factors to make the questionnaires more comprehensive (Van Tam *et al.*, 2021).

Step 3: Data collection – in order to collect the needed data, a real questionnaire was conducted by researchers after the pilot test step was completed. In this stage, a structured questionnaire was distributed to construction practitioners (e.g., project managers, contractors, site supervisors, consultants, craftsmen).

Step 4: Data analysis – the collected data were analyzed, evaluated and ranked by several methods such as simple proportion (Doloi, 2007; Hewage & Ruwanpura, 2006; Kazaz et al., 2008; Ng et al., 2004; Parkin et al., 2009; Rivas et al., 2011; Ugulu et al., 2016), mean score and standard deviation (Al-Abbadi & Agyekum-Mensah, 2019; Funso et al., 2016a, 2016b; Ghoddousi et al., 2015; Hewage & Ruwanpura, 2006; Jarkas & Radosavljevic, 2013; Jarkas et al., 2014; McFillen & Maloney, 1988; Shin et al., 2013; Shroff & Sridhar, 2011; Zakeri *et al.*, 1996), reliability (Doloi, 2007; Jarkas et al., 2014; Ohueri et al., 2018), factor analysis (Doloi, 2007; Dwivedula & Bredillet, 2010; Funso et al., 2016a), relative importance index (Al-Abbadi & Agyekum-Mensah, 2019; Hemanta Doloi, 2007; Enshassi et al., 2007; Ghoddousi et al., 2015; Gunduz & Abdi, 2020; Jarkas & Radosavljevic, 2013; Jarkas et al., 2014; Kazaz et al., 2008; Khan et al., 2011; Momade & Hainin, 2019; Ohueri et al., 2018; Van Tam et al., 2018), regression analysis (Hemanta Doloi, 2007; Gunduz & Abdi, 2020; Hai & Van Tam, 2019; Olomolaiye, 1990), structural equation modeling (Dwivedula & Bredillet, 2010; Ng et al., 2004; Olomolaiye, 1990), dynamic modeling (Nasirzadeh & Nojedehi, 2013), analytic hierarchy process (Aghayeva & Ślusarczyk, 2019).

Step 5: Concluding critical motivational factors – in the final stage, important motivational factors affecting CLP were discovered on the basis of the data analysis results in the previous stage. Also, discussions were undertaken on the ranked within each group and overall ranking.

4.3 Most common motivational factors affecting construction labor productivity

Through a comprehensive review of the 27 publications related to this topic that were analyzed in the present study, the motivational factors influencing CLP for each paper are represented in Table 3. The total number of motivational factors affecting labor productivity in the construction

industry that were identified from the 27 selected papers is 35. Nevertheless, the findings provided in Table 3 are factors that were identified in at least two publications.

The number of times a motivational factor was identified by the author is accumulated and presented in Table 3. Numerous studies have been undertaken to identify motivational factors influencing CLP. It is argued that identifying a set of global motivational factors is a critical strategy, this statement usually concludes with the question of labor productivity's reliance on a diverse set of motivational factors (Ghoddousi & Hosseini, 2012; Jarkas & Bitar, 2012; Soekiman *et al.*, 2011).

From the results analysis in Table 3, that several common motivational factors impacting CLP, but the top motivational factors that are: Rewards; Good relationship; Promotion opportunities; Job security; Good supervision; Amount of salary; and good work environment. Each of these motivational factors was identified 21; 20; 20; 17; 16; 15; and 14 times by the 27 publications considered in this study respectively. This evidence indicates how important ten of these motivational factors that have the most effect on CLP.

4.3.1 Rewards. The factor of rewards is one of the motivational factors influencing CLP, so it is not surprising that the factor was identified by 21 different publications as a determinant impacting labor productivity in the construction industry. The finding shows that being rewarded, while not being financially exclusive is key motivational factors that improved the construction workforce's productivity (Al-Abbadi & Agyekum-Mensah, 2019), which was further supported by the results from previous studies (Aghayeva & Ślusarczyk, 2019; Al-Abbadi & Agyekum-Mensah, 2019; Doloi, 2007; Funso *et al.*, 2016b; Ghoddousi *et al.*, 2015; Hai & Van Tam, 2019; Hewage, 2007; Jarkas & Radosavljevic, 2013; Jarkas *et al.*, 2014; Khan *et al.*, 2011; McFillen & Maloney, 1988; Momade & Hainin, 2019; Shroff & Sridhar, 2011). In this regard, the study was conducted by (Zakeri *et al.*, 1997) explained that it is improtant to promote and reward employees as a means of increasing their motivation and job satisfaction in order to ehance productivity in the workplace Furthermore, it is recognized the significance of being recognized for their abilities by being rewarded. As a result, managers should provide rewards as a means of demonstrating appreciation for their employees, demonstrating that the managers valued their tasks. Consequently, they tend to devote their entire attention to their organizations, which is the best way to increase their productivity.

4.3.2 Good relationship. A good work environment where have a good relationship between workmates is a key factor for the success of any task (Al-Abbadi & Agyekum-Mensah, 2019). That is why the factor of the good relationship was identified by 20 publications as a critical motivational factor impacting CLP. Numerous researchers stated that good relationship factor has a significant effect on labor productivity in the construction sector (Aghayeva & Ślusarczyk, 2019; Doloi, 2008). Possessing good communication is important for work crews and it leads to improved motivation degrees. In contrast, however, a bad relationship will lead to laborers doing tasks alone, which can lead to conflict within the crew that may influence their work motivation and performance levels. Also, the study of (Lingard & Francis, 2006) revealed that a good relationship between project managers and construction workers is generally believed to effects the performance of construction projects by providing a better working environment for the workforce.

4.3.3 Promotion opportunities. The promotion opportunities factor was identified in 20 different papers on motivating factors affecting CLP. It is obvious that a move up the career ladder impact organizational justice and work satisfaction of any employee (García-Izquierdo *et al.*, 2012). The evidence in the line with the results of previous studies (Doloi, 2007; Dwivedula & Bredillet, 2010; Hewage, 2007; Ohueri *et al.*, 2018; Olomolaiye, 1990; Parkin *et al.*, 2009; Shin *et al.*, 2013; Shroff & Sridhar, 2011; Ugulu *et al.*, 2016; Van Tam *et al.*, 2018; Zakeri *et al.*, 1997), which indicated that promotion opportunities have a high effect on labor productivity in the construction industry. Koch (2012) stated that the opportunity of promotion is desirable for any individual, only because employees work harder to compensate for incompetence. Consequently, a promotion at regular intervals of time has an optimistic approach behind and they are generally given to satisfy the psychological needs of laborers in their workplace (Koch & Nafziger, 2012). Likewise the

Table 3. Motivational factors affecting construction labor productivity

No.	Motivational factors	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Total
1	Rewards	x	x		x	x	x	x	x	x	x	x		x	x		x		x	x	x	x	x	x		x		x	21
2	Good relationship	x		x	x	x	x	x	x	x			x	x	x	x	x	x	x	x		x			x		x	x	20
3	Promotion opportunities	x	x	x	x	x	x	x	x	x			x	x	x		x		x		x	x			x	x	x	x	20
4	Job security	x	x	x	x	x	x	x	x	x				x	x	x			x		x	x					x	x	17
5	Good supervision	x			x	x	x	x	x		x	x		x					x	x		x	x		x		x	x	16
6	Amount of salary	x			x	x	x	x	x	x	x	x	x		x	x					x						x	x	15
7	Good work environment		x			x		x	x	x	x	x		x	x		x		x	x					x		x		14
8	Recognition programs		x	x		x	x		x					x					x	x	x	x		x	x		x		13
9	Participation in decision making	x		x	x		x	x	x	x		x		x			x											x	11
10	On-time payments			x						x	x	x		x		x			x			x	x	x				x	11
11	Work satisfaction					x		x		x		x	x		x		x		x							x		x	10
12	Giving responsibility							x	x	x		x	x	x	x	x											x	x	10
13	Challenging work opportunities	x	x		x	x		x	x					x							x							x	9
14	Opportunities to develop skills and abilities	x		x	x	x		x		x							x				x							x	9
15	Work appreciation and feedback	x	x	x		x	x	x									x									x		x	9
16	Working overtime				x	x		x			x			x						x	x							x	8
17	Freedom in work	x		x	x	x					x	x									x								7
18	Job training										x	x					x		x		x		x	x					7
19	Tools and equipment quality	x			x			x											x	x					x				6
20	Team cooperation	x			x			x						x				x							x				6

Table 3. Motivational factors affecting construction labor productivity (continued)

No.	Motivational factors	Publications																											Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
21	Organization's reputation		x				x				x	x		x					x										6
22	Relax amenities	x			x															x		x		x			x		6
23	Holidays and free time	x			x						x		x								x								5
24	Good management										x	x								x	x						x		5
25	Status in the organization		x				x			x						x													4
26	Respect receive from others	x			x			x																					3
27	Chances to accomplish something worth	x			x					x																			3
28	Safety procedures in site	x			x	x																							3
29	Inclement weather						x					x								x									3
30	Site location										x	x															x		3
31	Chances to learn new things	x			x																								2
32	Supervisor's direction and support	x			x																								2
33	Seeing the ultimate results of work	x			x																								2
34	Financial security		x															x											2
35	Rework						x																		x				2

1=(Hewage, 2007); 2=(Doloi, 2007); 3=(Dwivedula & Bredillet, 2010); 4=(Hewage & Ruwanpura, 2006); 5=(Funso *et al.*, 2016b); 6=(Jarkas *et al.*, 2014); 7=(Al-Abbadi & Agyekum-Mensah, 2019); 8=(Olomolaiye, 1990); 9=(Shin *et al.*, 2013); 10=(Khan *et al.*, 2011); 11=(Kazaz *et al.*, 2008); 12=(Parkin *et al.*, 2009); 13=(Zakeri *et al.*, 1997); 14=(Ghoddousi *et al.*, 2015); 15=(Nasirzadeh & Nojedehi, 2013); 16=(Momade & Hainin, 2019); 17=(Gunduz & Abdi, 2020); 18= (Ohueri *et al.*, 2018); 19=(Jarkas and Radosavljevic, 2013); 20=(Shroff & Sridhar, 2011); 21=(Ugulu *et al.*, 2016); 22= (Van Tam *et al.*, 2018); 23=(Enshassi *et al.*, 2007); 24=(Rivas *et al.*, 2011); 25=(McFillen & Maloney 1988); 26=(Ruthankoon & Ogunlana, 2003); 27=(Aghayeva & Ślusarczyk, 2019)

Engineering managers' recognition and the prospect of promotion are associated with professional development based on employee competency, and predominately show their determination for higher performance (Doloi, 2007). Also, Craftsmen on construction sites will work more productively when they believe there are opportunities for promotion (Ghoddousi *et al.*, 2015).

4.3.4 Job security. Job security has been proposed as a hygiene factor in the theory of two factors by (Herzberg *et al.*, 1959) and as an 'existence need' in the theory of ERG (Existence, Relatedness, and Growth) (Alderfer, 1972). The job security factor is ranked 4th among the top important motivational factors identified in the literature and was identified in 17 different articles. It is obvious that job security is the main influential tool of motivation and puts the individuals very far off from mental tension and they give their best to the companies, ultimately it leads to performance maximization (Sekhar *et al.*, 2013). Zhang (2004) demonstrated that working on an organization with job security, employees get confident with their future career and they put most efforts to gain the goals of their companies (Zhang & Wu, 2004). Besides, Yamamoto (2013) stated that laborers perceive they will be getting bonuses or rewards for a good job and their work is a secured one, their productivity will automatically be better. In the context of the construction industry, the finding was further support by different studies (Aghayeva & Ślusarczyk, 2019; Doloi, 2007; Dwivedula & Bredillet, 2010; Funso *et al.*, 2016b; Ghoddousi *et al.*, 2014; Nasirzadeh & Nojedehi, 2013), which revealed that job security is a major motivational factor impacting CLP. The study of (Ali *et al.*, 2012) proved that the primacy of job satisfaction for the construction workforce, and this factor is a determinant for the laborers in Iran construction industry.

4.3.5 Good supervision. In this regard, it is controlled based on the inspection of the tasks completed by the workforce. This factor was identified by 16 different publications on motivational factors influencing CLP. The study of (Maloney, 1983) demonstrated the important role of management factor, and to enhance performance, supervisors should positively control and guider workforce. Therefore, occurring an issue about lump laborers cannot be controlled, while companies possessing employed laborers have their effect on employee relations, and subcontractors have no manage or supervise over other subcontractors' workforce (Kazaz *et al.*, 2008). In construction site, supervisors or site engineers, whose major function is to control, supervise, and its numbers are changed depending on the percentage to site area or project characteristics. Hence, the number of construction workers supervised and the responsibility area of each supervisor should be at the optimum level towards performance maximum. The incompetence of supervisors is an issue, workers are highly concerned with the supervision personnel and questions of their competency. Laborers' requirements on their works should be accurately replied by supervisors or inspectors as quickly as possible, in contrast, it is not good for waiting for the answer because it may reduce work productivity and quality (Kazaz *et al.*, 2008; Ng *et al.*, 2004).

4.3.6 Amount of salary. As demonstrated in the previous studies, remuneration was not the only motivational factor, but money was an essential basic need for any individual in order to ensure their lives and prosper (Herzberg *et al.*, 1959; McLeod, 2007). The amount of salary factor was identified by 15 publications on motivational factors affecting labor productivity in the construction sector. Numerous researchers stated that the amount of remuneration is seen as the critical factor to motive construction workforce performance (Aghayeva & Ślusarczyk, 2019; Enshassi *et al.*, 2007; Funso *et al.*, 2016a; Ghoddousi *et al.*, 2014; Hewage, 2007; Khan *et al.*, 2011; Nasirzadeh & Nojedehi, 2013; Ohueri *et al.*, 2018; Olomolaiye, 1990; Shroff & Sridhar, 2011). In many developing countries, construction laborers are facing low-income problems (Ghoddousi *et al.*, 2014; Tabassi & Bakar, 2009), so the appropriate salary level is the vital role motivator encouraging them to higher performance (Kazaz & Ulubeyli, 2007; Zakeri *et al.*, 1997). Remuneration is a powerful motivation, the low salary was a primary demotivating to the construction workforce, so without sufficient incomes, it is unlikely that they will conduct their work well. In addition, paying wages on time is also an important factor of any job contract,

whereas sufficient facilities and a better work climate many leads to reducing the demotivation caused by low income, delaying payment basically do not (Kazaz *et al.*, 2008).

4.3.7 Good work environment. A good work climate with sufficient work conditions may lead to enhance individual job satisfaction and commitment of laborers with their organization, it can make individuals effort their best which may improve labor productivity (Jung & Kim, 2012). The factor of the good work environment was identified by 14 studies on motivational factors affecting CLP such as (Al-Abbadi & Agyekum-Mensah, 2019; Doloi, 2007; Funso *et al.*, 2016a; Ghoddousi *et al.*, 2014; Kazaz *et al.*, 2008; Khan *et al.*, 2011; Momade & Hainin, 2019; Ohueri *et al.*, 2018; Olomolaiye, 1990; Shin *et al.*, 2013). In this regard, the construction workers' environment is approached from the perspective of work content and context. In particular, job content includes a variety of activities related, the experience or practical skills needed, and the challenge tasks provided, whereas, contextual aspects contain work climate, material resources, supervision or inspection, and compensation practices (Maloney, 1986). Employers should perceive the workforce that is concerned with contextual aspects and hence, would be motivated by elements that enhances the working environment in their companies. Besides, working in a bad condition will only sequence negative results due to construction works are physically and mentally demanding, so construction workforce should be worked in a good work environment in order to increase their performance (Dwivedula & Bredillet, 2010; Sekhar *et al.*, 2013).

5. Future research areas

The current study has reviewed the implications of numerous studies on motivational factors affecting labor productivity in the construction industry. As a result, the author has highlighted some knowledge gaps relating to motivational factors toward improving construction workforce productivity which provides a strong platform for further studies as follows:

Depending on the circumstances, the frequency and importance of motivational factors vary from project to project, country to country, and even within the same project (Olomolaiye, Jayawardane, & Harris, 1998). A large number of motivating factors influencing CLP were identified and evaluated in previous studies so far which draw a comprehensive picture in construction work motivation. Therefore, key motivational factors (i.e., rewards; good relationship; promotion opportunities; job security; good supervision; the amount of salary; good work environment; recognition programs; participation in decision making; and on-time payments) should be examined in more depth in future empirical researches.

The findings also reveal that the previous studies have largely ignored the impact of autonomous work motivation of the construction workforce (i.e., identified regulation; integrated regulation; intrinsic regulation). In the context of the construction industry, almost previous studies on motivational factors which focus controlled motivation such as external regulation and introjected regulation (i.e., external regulation is the prototypical form and reflects behavioral engagement reinforced by rewards of punishment, and introjected regulation reflects participating in behaviors out of a sense of externally referenced obligation like the avoidance of guilt or the promotion of contingent self-worth (Gagné & Deci, 2005; Ryan & Deci, 2000)). However, in recently, starting a study focuses on autonomous motivation like study was conducted by (Johari & Jha, 2020) which indicated that various variables impacting work motivation on construction workers to build multistory residential buildings in India such as amotivation; extrinsic regulation (social); extrinsic regulation (material); introjected regulation; identified regulation; intrinsic motivation. A clear gap exists in the literature concerning the identification of variables influencing CLP from the perspective of autonomous work motivation, hence, it is further recommended that future studies should focus to solve this knowledge gap.

6. Conclusions and limitations

Work motivation as a catalyzer for the construction workforce to complete the task in a much better way than they usually do which may lead to improve working performance in construction

projects (Sekhar *et al.*, 2013). In this study, the authors analyzed the findings of previous studies on motivational factors affecting labor productivity in the construction industry on the basis of examining a comprehensive literature review. the analysis results indicated that the majority of studies were conducted in Asian counties, followed by Europe, Africa, America, and Australia Pacific; Qatar, Iran, Turkey, and Nigeria have a higher number of publications to contribute to studying motivational factors affecting CLP. However, having a big knowledge gap as no research to the date has been carried out in nations of the South American continent, and several studies were conducted in Australia Pacific, Africa, and Europe. This study indicated that almost previous studies adopted the methods of empirical research for identifying and evaluating of motivational factors with a prevalent procedure includes 5-step is that identifying motivational factors on the basis of a review of existing literature; pilot study; data collection; data analysis; and concluding critical motivational factors.

Utilizing analysis of the 27 publications related to motivational factors impacting CLP. It was found that numerous critical factors impacting labor productivity in the construction sector, but the top comment motivational factors that have the most impact on labor productivity in the construction industry are rewards; good relationship; promotion opportunities; job security; good supervision; the amount of salary; and good work environment. Therefore, it is encouraged that engineering managers, project managers, employers should focus on top influential factors to ensure effective management and improve the productivity of the construction workforce. This study has provided a general overview of the development of motivational factors affecting CLP, hence formed a solid platform for scientists for further studies. Besides, from knowledge gaps were explained, it is recommended that the checklist of motivational factors impacting labor productivity in the construction industry developed in this study would be used for further analysis to allow for comparison to the results identified in this study.

The study's principal weakness is that the use of specific keywords to find papers on this area does not cover all possible possibilities. As a result, the research findings may not fully reflect the total literature on this topic. This study used a Scopus dataset, therefore any limitations in Scopus coverage in publications could have an impact on the quality of the data used. Future studies should be conducted on a regular basis to address the limits of using data from various sources, search algorithms, and strategies.

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Impact of Sustainable Supply Chain Management Practices on Organizational Performance in Ghana

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Abstract: The study explores the impact of ecological supply chain management practices such as Green Supply Chain, environmental and operational management practices of organizational performance in Ghana. The organizational performance was measured based upon three parameters constituting Sustainable Environmental Performance (SENP), Sustainable Economic Performance (SECP), and Competitiveness (COMP). Exogenous factors included the constructs of Sustainable Supply Chain Management (SSCM) practices and the single-item construct voluntary adoption of SSCM practices, while endogenous variables included the three aspects of firm performance. The relationship between sustainable management practices and organizational performance was ascertained using Structural Equation Modeling. A few significant results are presented as follows; (1) Environmental Management Practices (EMP) results in enhanced Sustainable Environmental Performance (SENP) and Sustainable Economic Performance (SECP); (2) Organizational Performance has a strong correlation with SECP and COMP; (3) SECP has a substantial and favorable relationship with both competitiveness and sustainable environmental performance, as well as sustainable economic performance. The positive relationship between SSCM practices and firm performance demonstrates that continual sustainable management principles eventually improve community capacity. This ultimately results in an organization's competitiveness. Additionally, the managerial implications of the results are addressed.

Keywords: Sustainability; supply chain management practices; organizational performance; structural equation modeling

1. Introduction

The sustainability of today's companies is becoming more critical due to environmental degradation and human rights violations (Gladwin *et al.*, 1995). Recent developments in the business environment show that pursuing economic goals alone may not be a viable long-term strategy for a company's long-term sustainability and profitability if the company's actions result in irreversible damage to the ecosystem and failure to ensure employee safety, security, minimum wage, healthcare, and better working conditions. Literature reports many studies on Green Supply

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Chain Management (GSCM) that aim to define the structures of GSCM practices and their impact on the economic and environmental performance of organizations (e.g., Zhu & Sarkis, 2004; Darnall *et al.*, 2008; Rao & Holt, 2005). There is just a few theoretical research on Sustainable Supply Chain Management (SSCM) in the Supply Chain Management SCM literature (Linton *et al.*, 2007; Vachon & Mao, 2008). Early studies have failed to capture all the essential aspects of SSCM. In Pullman *et al.* (2009) study, the effects of social and environmental sustainability efforts on a company's performance were examined. SSCM procedures were outlined by Marshall *et al.* (2015) as those that include social and environmental considerations, using Irish businesses as specific case scenarios.

Additionally, organizations' sustainability of expansion is increasingly being questioned by the global society through the media and non-governmental organizations (NGOs) (Zhu & Sarkis, 2004). Porter and Kramer (2006) stated that businesses must increasingly go outside their operations to satisfy the sustainability requirements of their customers. Firms with a vision are already working to make their supply chains more sustainable. The industry is becoming more conscious of the problems in modern supply chains. Numerous industrial companies now produce waste and pollution, jeopardizing the planet's existence. These obvious challenges and requirements have compelled companies to assess their activities' environmental impact. As the world's population increases and resource availability decreases, businesses see the need to rethink supply networks (Carter & Jennings, 2002). Companies must present an image of environmental stewardship via their products, processes, systems, technology, and business practices (Vachon & Klassen, 2006).

Considering recent changes in the global economic climate, businesses should consider rebuilding and restructuring to improve their strategy for maintaining company and profitability while staying competitive. Gupta and Palsule-Desai (2011) outlined the conceptual underpinnings of SSCM in Ghana. Social sustainability was not included in Mitra and Datta's (2014) empirical SSCM findings. Stakeholder pressure makes it harder for supply chain managers to adopt sustainable practices. Ensuring a sustainable supply chain includes using recyclable packaging, returning old products to manufacturers, and properly disposing of garbage. However, some of the most critical obstacles to adopting sustainable practices are related to issues like price competitiveness and responsiveness. Despite Europe and Asia's different views on corporate social responsibility and sustainability, Mol and Carter (2006) claim Asia values sustainability. Zailani *et al.* (2012) studied Malaysian sustainable supply chain management drivers. However, Eltayeb and Zailani (2014) examined how certified manufacturing businesses in Ghana adopt a green supply chain. This study is interested in establishing how Ghanaian companies are involved in the sustainable supply chain. This article will examine sustainable supply chain practices inside a business and their connection to the supply chain's performance. This paper is structured into five parts. This article begins with an introduction section that gives context for the research subject and the study's shortcomings. A review of sustainable supply chain strategies and performance is provided in Section 2. On the other hand, Section 3 describes the methodology, while Section 4 shows the study's findings. Section 5 concludes the paper's objective by discussing the results, implications, and future study directions.

2. Literature review

2.1 Sustainable Supply Chain Management (SSCM)

Sustainability refers to adhering to the triple bottom line of social, environmental, and economic obligations. Sustainability and SCM have long been contentious issues (Wang *et al.*, 2018). Several writers have emphasized on different aspects of sustainability and SCM. Lambert and Enz (2017) describe SCM as integrating critical business operations that deliver multiple stakeholders' information, goods and services. They define it as a systematic, well-planned integration of traditional business operations and strategies across business divisions in a company's supply chain, with the primary goal of enhancing the outputs of that great organization and its supply chain.

Stock and Boyer (2009) described it as the process of managing affiliated organizations and business divisions inside a company. These systems enable the movement of goods and services from the main to secondary sources. From the definitions, SCM is built on product and service movement, coordination of supply chain players, and information exchange. According to Ahi and Searcy (2013), SCM has the following key characteristics: flow, coordination, stakeholder, connection, value, efficiency, and performance. Academics are struggling to reconcile sustainability's triple bottom line with SCM's fundamental characteristics.

Pagell and Gobeli (2009) created the term SSCM in the business environment. SCM's fundamental components must be utilized to minimize environmental and social impacts. To accomplish this goal, SSCM must include ecological and social evaluations. It is the planned coordination of critical cross-organizational business operations to allow the company and its supply chains to achieve long-term financial outcomes. The study highlights the need to address environmental and social aspects of sustainability in supply chain operations. They help businesses improve internal processes (Wang *et al.*, 2018).

2.2 Green Supply Chain Management (GSCM)

Researchers and practitioners appreciate the need to investigate the concept of a green supply chain. Eco-friendly management has been studied extensively by numerous researchers (Bowen *et al.*, 2001). Previous research focused on monitoring its partners' compliance with environmental laws to prevent and minimize negative consequences (Viscusi, 1983). Green activities have been deemed unprofitable in this research stream, and the emphasis has moved to mitigate the damaging effects of a company's operations. GSCM adoption offers a competitive advantage and may enhance organizational performance (Atasu *et al.*, 2008; Juma *et al.*, 2021). Numerous studies as mentioned above have shown the value of proactive GSCM methods, including early supplier involvement. Green management may help companies achieve lean management, which improves performance (Kainuma & Tawara, 2006). GSCM involves valuation of the environmental performance of the suppliers, so as the environmental impact of their goods can be minimized (Mahmoudi *et al.*, 2021). Suppliers must be engaged in GSCM accomplishment to achieve sustainable integration. Also, research shows that resource reconfiguration is required for GSCM success (Dangelico *et al.*, 2017). GSCM actions have been quantified using internal environmental management (IEM), Green Purchasing, and Eco Design. This research utilized green buying, Eco-design, and reuse, and recycling to evaluate investment recovery. We emphasize two GSCM factors: environmental design and recycling (Spangenberg *et al.*, 2010). Early in the product's life cycle, eco-design is included, followed by reuse and recycling.

2.3 Green Growth and Green Innovation

Sustainable supplier selection has been a hot subject of discussion among academics over the past few decades. It manifests itself in a variety of ways. Indeed, it creates room to facilitate prudent supplier decisions and selections. The company must set criteria for supplier selection (Toloo & Nalchigar, 2011). Mani *et al.* (2014) identified green suppliers using fuzzy set theory. A case study was given to demonstrate the method's feasibility. They utilized AHP to locate the most qualified vendor. This was suitable for usage in cars and cement industries, coupled with manufacturing firms. Trapp and Sarkis (2016) further recommended the optimization of supplier sourcing. Their approach makes use of novel integer programming techniques using an integrated approach (Luthra *et al.*, 2017). AHP and VIKOR methods were used to identify the leading supplier utilizing Delivery Schedule Adherence (DSA) to identify environmentally friendly suppliers. They repaired the Differential Evolution (DE) algorithm by exploiting the Data Envelopment Analysis (DEA) weaknesses. DEMATEL algorithms were adopted to locate a sustainable supplier. They believe that a simple set reduces risk. Then solar air conditioners became popular. Since the 1970s, sustainable supplier selection has been researched. Identifying sustainable suppliers via the use of ANP and VIKOR. Sustainability in supplier selection is not a novel concept. Before selecting a

supplier, a business must ascertain its requirements (Toloo & Nalchigar, 2011). Jauhar and Pant (2017) enhanced Data Envelopment Analysis (DEA) via the usage of DE. They compare DEMATEL pairings of manufacturing firms. This is increasing our understanding of ecologically responsible development and green innovation (Albort-Morant *et al.*, 2016). Recently, academics examined the link between professional environmental efforts and competitive success (Guoyou *et al.*, 2013). Consumer-driven green innovation is motivated by environmental sustainability (Albino *et al.*, 2009). Therefore, businesses produce ecologically friendly products (Dangelico & Pujari, 2010). Businesses should invest in environmentally friendly technologies and research green innovation to enhance their environmental practices and effectiveness (Galdeano-Gomez *et al.*, 2013). Economists believe that economic advancements may assist companies in gaining a competitive advantage. Cuerva *et al.* (2014) argued that green innovation is inextricably linked to environmental and quality management systems. Green innovation (GI) requires environmental regulations and legislation and market pressure (De Medeiros *et al.*, 2014; Shahzad *et al.*, 2020). The eco-efficiency and sustainability of green technologies influence their performance (Chang, 2016; Lopes *et al.*, 2017). Environmental stewardship and sustainability are becoming more important in GI. Despite the above numerous models adopted for the study, this study sought to investigate the same phenomenon using SEM to corroborate or disproof whether the same happenings occur within the Ghanaian setting.

2.4 SSCM Practices

To help operationalize the SSCM idea, knowledge of essential activities or practices linked to sustainability and SCM is required. Academics have also researched and emphasized sustainable distribution, packaging, and reverse logistics (Pagell & Wu, 2009). For Beske *et al.* (2014), proactive risk management and strategic direction are required. Sustainable manufacturing, design, distribution, and investment recovery were the focus of Esfahbodi *et al.* (2016). As shown before, academics' SSCM methods are heavily influenced by their research goals. This has helped SSCM practices flow. This study presents SSCM via the perspective of three key SCM components (2009). Stock and Boyer (2009) define the material flow, supplier cooperation, coordination, and information sharing. It incorporates sustainability into the components of purchasing, supplier cooperation, and information exchange (Weeratunge & Herath, 2017). The SSCM core was modified for this research (Stock & Boyer, 2009). Green *et al.* (2012) advise evaluating the impact of SSCM on performance. Overall, SSCM effect on organizational performance is more helpful. These included green information exchange, supplier partnerships, and sustainable buying. A summary of the study's SSCM components.

2.5 Environmentally Sustainable Management Practices and Organizational Performance

Environmental Management Practices (EMP) include implementing ecologically responsible systems for raw material procurement, clean manufacturing, eco-friendly product design and distribution, and so on (Zhu *et al.*, 2007). In contrast, Environmental Performance (EPR) is quantified by reducing toxic material discharge, the cost of effluent treatment, and so on. Established via their study findings that the implementation of EMP increases EPR. Pullman *et al.* (2009) presented environmental sustainability strategies in protecting facility resources and land management result in improved EPR. Vachon and Mao (2008) demonstrate a positive connection between EPR, EMP, and the robustness of the supply chain.

Darnall *et al.* (2008) claim that companies using EMS are more likely to adopt green supply chain management (GSCM). This increases environmental sustainability and, therefore, EPR. According to Melnyk *et al.* (2003), companies with established and accredited environmental management systems have a higher EPR than those without. Yang *et al.* (2011) found an EMP-EPR positive correlation. Sustainable packaging (Zailani *et al.*, 2012) and sustainable buying (Laosirihongthong *et al.*, 2013), increases EPR. Klassen and Whybark (1999) show that implementing pollution control technology enhances EPR. The research supports the following theory:

H1a: Environmental performance is favourably correlated with sustainable environmental management practices of Ghanaian Manufacturers.

Operations performance (OPR) is a word that refers to an organization's enhanced operational efficiency, which is often expressed in terms of cost savings, decreased energy use, and improved logistical efficiency. According to Rao and Holt (2005), adopting EMP leads to cost reductions, efficiency gains, and higher output. Klassen and Whybark (1999) show how incorporating environmental protection technologies improves a manufacturing organization's performance. According to Melnyk *et al.* (2003), having a formal or certified EMS is associated with better performance in terms of cost savings, quality, etc. González-Benito *et al.* (2005) demonstrates that using EMP improves operational performance, especially in logistics. However, as Pullman *et al.* (2009) explain, EMP has no apparent relationship with quality or cost performance. However, Zailani *et al.* (2012) show that environmental buying improves OPR. Existing literature demonstrates a generally strong connection between EMP and OPR. Based on this observation, the following hypothesis is made:

H1b: Environmentally responsible management strategies have a favourable correlation with the operational success of Ghanaian Manufacturers.

2.6 Operational Practices and Organizational Performance

Operational practices include using operations management methods to increase efficiency, decrease inventory, and eliminate waste across the value chain. As previously stated, operational performance refers to the degree to which an organization's performance improves due to cost savings and increased efficiency due to the operational practices implemented. According to the above reasoning, operational procedures should logically increase both operational performance and competitive advantage. Kaynak (2003) claimed that improved processing and supplier quality management techniques result in improved quality management and inventory management performance. Advanced operations management systems have a statistically significant beneficial connection with mass and lean operational performance (González-Benito *et al.*, 2005). When it comes to operational procedures like supply chain integration and supply chain coordination, Kannan and Tan (2005) revealed these parameters assist a company to be more competitive in the long run.

Literature (Yang *et al.*, 2011; 2010) suggests that lean manufacturing enhances market and financial performance. Supply chain strategies and continuous improvement techniques like Just in Time and Total quality management enhance a firm's cost, quality, and delivery competitiveness. According to Li *et al.* (2006), SCM processes that contain all essential components significantly improve an organization's performance and competitive advantage. Thus, two hypotheses can be advanced:

H2a: Operational practices and performance are favorably correlated among Ghanaian Manufacturers.

H2b: Operational practices have a favorable positive correlation with a firm's competitiveness among Ghanaian Manufacturers.

2.7 Relationship Between Operational and Environmental Performance and Organizational Competitiveness

Although the connection between environmental performance and competition seems unclear, it favors a positive outcome. Klassen and McLaughlin (1996) demonstrate that businesses that perform better environmentally are expected to do better financially. According to Pullman *et al.* (2009), there is a significant positive connection between environmental and quality performance, but not between environmental and cost performance. Rao and Holt (2005) claim that better environmental performance leads to better commercial performance and better competitiveness. A strong positive relationship between environmental performance improvement and cost-competitive advantage is shown by López-Gamero *et al.* (2009). Yang *et al.* (2011) links

environmental performance to market and financial success. Considering the above, we hypothesize:

H3: Environmental performance has a favourable correlation with a Ghanaian manufacturing firm's competitiveness.

The competitiveness of an organization can be improved through an increase in economic performance in areas such as delivery, responsiveness to customer needs, reduction in cost of production, increase in products quality and many more. Numerous researches have demonstrated these assertions (Kaynak, 2003; Kannan & Tan, 2005). According to Zain and Kassim (2012), continual development results in increased company competitiveness, which significantly impacts business performance. According to Ahmed *et al.* (2014), developing a company's economics skills improve a firm's performance. As a result, the following hypothesis is made:

H4: There is a positive association existing between Economic performance and Manufacturing firms' competitiveness.

2.8 Eco-design and Organizational Performance

Eco-design is the process of developing and using technical innovations to minimize damage to the environment throughout the supply chain (Zhu *et al.*, 2008). This design approach impacts the whole life cycle of goods. Environmental problems must be addressed early in the design process, such as during planning and conceptual design phases. The design level accounts for almost 80% of all product-related environmental impacts (Spangenberg *et al.*, 2010). Eco-design, therefore, must be dealt with comprehensively, from the beginning (buying) to the end (distribution to consumers). To develop environmentally-friendly goods, the manufacturing firm must collaborate with its suppliers by taking market requirements or rivals' strategies into account (Koufteros *et al.*, 2007). Suppliers may stay current on market developments via knowledge-sharing procedures to share information with buyers, strengthening coordination (Cousins *et al.*, 2006). It also improves supply chain performance by decreasing partner coordination time and boosting market-focused goods (e.g., Eco-design).

2.9 GSCM and Organizational Performance

GSCM and supply chain performance has been studied from different perspectives (Schaltegger & Burritt, 2014). Usually, corporate performance has been characterized by the quality of the company's financial, operational, and product performances (Tsoulfas & Pappis, 2008). Environmental performance has been essential, but environmental concerns are also growing (Wu, *et al.*, 2015). Environmentalists have been seeking to promote environmentally conscious buying habits among customers in recent years. The following are examples of environmental performance measures: carbon monoxide emission, wastewater water, and solid waste (Zhu & Sarkis, 2004). Berry and Rondinelli (1998) have shown that practical environmental management policies successfully prevent hazardous behaviours. Prior studies have shown positive results from GSCM implementation; our research follows in their footsteps by minimizing negative consequences and eco-friendly design (Zhu *et al.*, 2008). Those two elements may cover the whole of the manufacturing process. A supply chain may work together to achieve success in green supply chains, in which businesses can detect issues that damage the environment. This research hypothesizes that.

H5a: There is a positive effect of Eco-design on Ghanaian Manufacturing firms' environmental performance.

It is usually the most crucial element for companies to adopt new strategies. GSCM is a relatively new approach for companies; hence, we must demonstrate the connection between environmental management and economic success (Rao & Holt, 2005). It is believed that bettering the environment may help businesses manage risk and gain in innovation and profit (Tsoulfas & Pappis, 2008; Berry & Rondinelli, 1998). Another benefit of publicizing the firm's green management policies is that it improves its reputation and profitability or financial gains. Studies

have shown that businesses benefit from improved profit margins by introducing new standards using GSCM (Hart & Ahuja, 1996). Based on these findings, a tentative theory is posited.

H5b: GSCM improves an organization's operational performance.

The study was based on the premise that informed a research model and, thus, a specific methodology was created. This gives entrepreneurs in Ghana the ability to conclude, evaluate results, and make strategic managerial inferences about sustainable management practices. The following diagram describes the concept shown in Figure 1. In the picture below, you can see the suggested model designed for this study. The model considers three SSCM practice components independent variables and three SSCM performance construct dependent variables. The picture below demonstrates how this supposed connection is represented. This was already stated in the hypothesis section. A staff count was utilized to control the influence of a company's size on SSCM processes and performance metrics.

3. Research methodology

3.1 Demographics

The study employed an explanatory research design to examine the significant connection between the research variables. The demographic characteristics of this research was manufacturers and suppliers in Ghana's capital city of Accra. Two hundred manufacturing businesses were randomly selected for the study to ensure that all responders had an equal opportunity. Simple random selection ensured that all responders from different companies had an equal chance of being chosen. Table 1 shows the respondents' demographics.

3.2 Research instrument

We gathered data using a questionnaire survey technique, which is very common in business research. We structured the questions for data collection and analyzed them using AMOS (v22) software to establish the inferential connection between the variables. The questionnaire utilized a 5-point Likert scale to express the respondent's intensity and emotions to the relationship that exist between sustainable supply chain management practices and supply chain performance. The Likert scale ranged from (1= "strongly agree") to (5 = "strongly disagree") was adopted for the data collection on the construct measured. We requested three experienced researchers to evaluate the
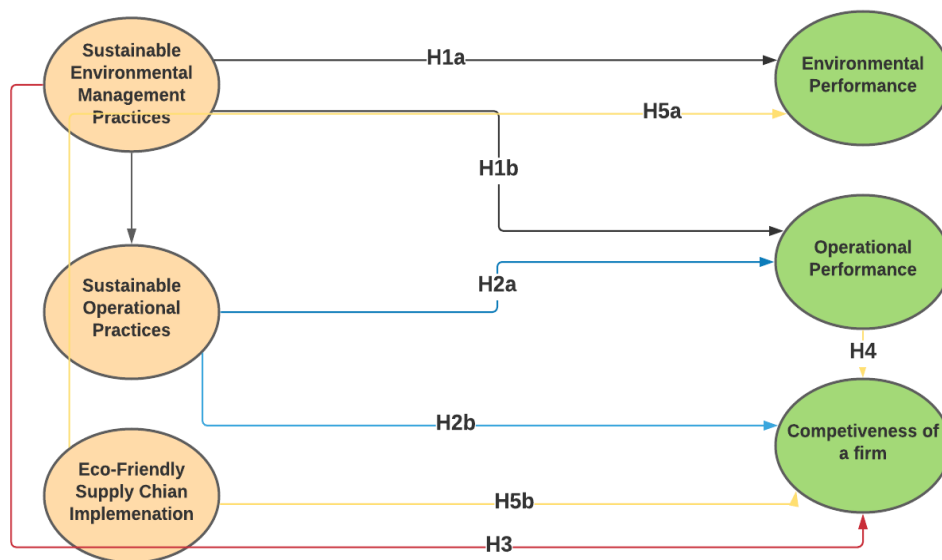

Figure 1. The conceptual framework of the study

Table 1. Respondents' demographics

Variables and Sub-scale	Frequency (%)	Variables and Sub-scale	Frequency (%)
1.　GENDER		5.　TYPE OF INDUSTRY	
Male	127 (63.5)	Food	33(16.5)
Female	73(36.5)	Mining	11(5.5)
2.　EDUCATION		Service	41(20.5)
Undergraduate	73(36.5)	Pharmaceutical	21(10.5)
Graduate	51(25.5)	Agriculture	57(28)
Postgraduate	66(33)	Cosmetics	14(7)
Doctorate	10(5)	Consultancy	10(5)
3.　EXPERIENCE		Media	4(2)
< 5 years	93(45.5)	Fabrics	4(2)
6-10 years	40(20)	Shipping	4(2)
11-15 years	18(9)	6. COMPANY'S AGE	
16-20 years	13(6.5)	< 5 years	80(40)
>20 years	24(12)	6-10 years	63(31.5)
4.　POSITION		11-15 years	25(12.5)
Production officer	36(18)	16-20 years	22(11)
Purchasing officer	57(28.5)	>20 years	10(5)
Assistant Manager	59(29.5)	7. NUMBER OF EMPLOYEES	
Senior Manager	29(14.5)	<100	65(32.5)
Managing Director	9(4.5)	101-500	46(23)
CEO	10(5)	501-1000	43(21.5)
		10001-2000	26(13)
		>2000	20(10)

survey questions in the first round for appropriateness and ambiguity. The survey questions were modified in response to the comments to ensure that they were tailored and pragmatic. Four SCM practitioners were then given the survey questionnaires. They double-checked the questionnaire's Items dimension for relevance to the research objectives and hypothesis that governed the study. Testing yielded survey items with high content validity.

For SSCM, three aspects were chosen, namely Environmental, operational, and eco-friendly management methods. The online survey data was verified for accuracy. Next, the data was coded and entered IBM SPSS (v25) and then into AMOS (v22). The first portion was assessed using frequency and percentages. The Structural Equation Model was used (SEM). Third, SEM was used to quantify the study hypotheses, particularly Explanatory and Confirmatory Factor Analysis (CFA). Variance Inflator Factors (VIF), NFI, GFI, RMSEA, X2/df, CFI, and AGFI was used to assess model fitness.

4. Results and discussion

An analysis of the relationship between sustainable supply chain management and company success was conducted (SEM). Exogenous and endogenous variables are correlated using complicated series and statistical estimations.

Our structural model's construct validity was assessed utilizing the CR and AVE (Fornell & Lacker, 1981). Convergent validity requires an AVE of 0.50 (Chin & Yao, 2014). The square root of each latent construct's AVE should exceed the correlation coefficients between them (Fornell & Lacker, 1981). Table 2 shows that the AVE for each latent construct exceeds the inter-correlations. Difficulty in discriminating Also tested for dependability was Cronbach's alpha and Composite reliability. Composite reliability of 0.60 and Cronbach's reliability of 0.70 (Devon *et al.*, 2007) was considered satisfactory. This criterion was not met, as seen in Table 3. So, conclusions made from the results of the study are reliable.

Table 4 presents the structural model's findings. All standardized factor loadings in Table 2 have t-values greater than 1.96 ($t_{cal} > t_{critical}$). Chin (1998) proposed factor loadings for assessing the relationship between independent and dependent variables (Field, 2009; Hair et al., 2006). As presented in Table 4, the Standardized Factor Loadings are over the limit for such analyses.

Table 2. Correlation Matrix

Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8
EMP	45.43	6.63	**0.902**							
OP	58.21	5.79	0.718**	**0.907**						
ECP	57.23	5.78	0.657**	0.650**	**0.903**					
SECP	61.13	6.66	0.655**	0.344**	0.572**	**0.904**				
SENP	69.23	5.09	0.604**	0.187**	0.174**	0.356**	**0.901**			
COMP	70.12	5.89	0.631**	0.651**	0.123**	0.241**	**0.561**		**0.858**	

*** Correlation is statistically significant at the 0.01 level (2- tailed); diagonals: AVEs's square root

Table 3. Fitting Indices

Fitting Index	Fitting Parameters						
	x/df	RMSEA	CFI	TLI	GFI	NFI	SRMR
Fitting Indices	1.532	0.0521	0.929	0.952	0.944	0.948	0.0423

Table 4. Results of the structural model

Latent Variable	Items	Standardized loading	t-value	p-value	AVE	CR	Cronbach's Alpha
EMP	EMP1	0.81	8.53	***	0.814	0.909	0.813
	EMP2	0.85	8.55	***			
	EMP3	0.84	8.51	***			
	EMP4	0.87	a	a			
	EMP5	0.86	7.98	***			
	EMP6	0.83	8.35	***			
	EMP7	0.88	8.92	***			
OP	OP8	0.81	7.96	***	0.823	0.911	0.823
	OP9	0.83	a	a			
	OP10	0.81	8.48	***			
ECP	ECP11	0.89	7.98	***	0.815	0.935	0.829
	ECP12	0.86	a	a			
	ECP13	0.82	7.69	***			
SECP	SECP14	0.89	7.98	***	0.817	0.922	0.918
	SECP15	0.91	8.09	***			
	SECP16	0.81	a	a			
	SECP17	0.84	7.19	***			
	SECP18	0.85	7.98	***			
SENP	SENP19	0.85	7.36	***	0.812	0.812	0.816
	SENP20	0.78	7.28	***			
	SENP21	0.84	a	a			
	SENP22	0.87	7.88	***			
	SENP23	0.83	7.28	***			
COMP	COMP24	0.87	7.44	***	0.736	0.911	0.796
	COMP25	0.88	7.78	***			
	COMP26	0.88	a	a			
	COMP27	0.81	7.82	***			
	COMP28	0.91	7.71	***			

$AVE = \sum \frac{K^2}{n}; CR = \frac{(\sum K)^2}{(\sum K)^2 + \sum(1-K^2)}$; where *K* denotes the factor loadings of all items in a build and *n* denotes the number of things in a construct; ***p-value < 0.001 (2-tailed); a: Unitized parameter.

Table 4 briefly describes the degree of relationship that exists between all the constructs under investigation.

The model's "fitness" to the data is estimated to determine whether was deemed appropriate to measure the relationship that exist between the dependent and independent variables. Model fit evaluation is used to verify a theoretical model via parameter fitting (Benah & Li, 2020; Kir et al., 2021). The model's fitness was assessed using the RMSEA, CFI, TLI, GFI, NFI, and Standardized Root Mean Square Residual indices (SRMR). Kline (2005) recommends providing model 2,

RMSEA, CFI, and SRMR as minimal model fit indices. The research analysis revealed the model for both the individual construct and the entire study was acceptable, which validates the study's results, as shown in Table 3.

The statistical significance of the eight hypotheses was determined using structural equation modelling at a 95% confidence interval. Environmental performance, sustainable economic performance, and competitiveness are all measures of firm performance in the manufacturing sector.

Proposition 1: Environmental performance is favorably correlated with sustainable environmental management practices of Ghanaian Manufacturers (H1a). Environmentally responsible management strategies have a favorable correlation with the operational success of Ghanaian Manufacturers (H1b).

Proof of Proposition 1: Sustainable Environmental management methods and environmental performance of businesses in supply chain sectors, including food, mining, services, among others, are shown in Table 5. As shown by the coefficient ($\beta_{1a} = 0.86$; $p < 0.001$), an increase in sustainable environmental practices such as addressing customer concerns about eco-friendly product distribution, along with middle-level managers always supporting the establishment of green sustainable management goals would increase environmental performance by (.86). The researchers reject the null hypothesis and hence, investigated the alternative hypothesis. Another hypothesis examined showed a link between sustainable ecological practices and the environmental performance of the Ghanaian businesses studied. The coefficient ($\beta_{1b} = 0.81$; $p < 0.001$) shows that improving sustainable environmental practices enhances supply chain performance in Ghana. The findings of the study corroborate with the literature (Harms et al., 2013; Rao & Goldsby, 2009; Zailani et al., 2012; Zhu et al., 2007).

Proposition 2: Operational practices and performance are favorably correlated among Ghanaian Manufacturers (H2a). Operational practices have a favorable positive correlation with a firm's competitiveness among Ghanaian Manufacturers (H2b).

Proof of Proposition 2: SEM was used to test the second study hypothesis. Table 5 shows a strong positive relationship between operational practices and performance. Table 5 indicates that the study's analysis accepted the hypothesis ($\beta 2a = 0.87$ and $p < 0.001$). For instance, the operational practices of keeping inventory under control, implementing lean production, and achieving economies of scale positively influence firms' operational performance by 87%. The research showed that a 1% improvement in the operational practices increased a firm's competitiveness by ($\beta_{2b} = 0.87$; $p < 0.001$). In other words, operational methods would enhance product quality, overall productivity, and competitiveness (Kaynak, 2003; Yang et al., 2010). Advanced operations management systems and mass and lean operational performance are linked and in connection with the conclusions of González-Benito et al. (2005) and, Kannan and Tan (2005).

Proposition 3: Environmental performance has a favourable correlation with a Ghanaian manufacturing firm's competitiveness (H3).

Proof of Proposition 3: Table 6 shows that environmental performance has a statistically significant beneficial impact on a firm's competitiveness. This was amply reflected in the coefficient ($\beta_3 = 0.85$; $p < 0.01$), showing that environmental performance such as reducing air emission, water, and consumption of hazardous materials, and increase in energy save significantly influences firms' ability to engage in sustainable competitions. This signifies that the environmental performance appears to positively associate with competitiveness in creating opportunities for the firm to target new green sustainability-sensitive customers. This will allow the firms to have a competitive advantage over other firms that fail to practice sustainable environmental, operational, and eco-friendly management practices. The findings of the study corroborate with the literature (Rao & Goldsby, 2009; Yang et al., 2011).

Proposition 4: Economic success and manufacturing company competitiveness are positively correlated (H4).

Proof of Proposition 4: Table 5 shows a favorable correlation between economic success and business competitiveness. This was revealed in the coefficient (β_4 =0.86; p < 0.01), indicating that economic performance such as improved operations and supply chain performance logically improves competitiveness. This echoed the fact that a percentage increase in economic performance. Again, improvement in a company's per-share earnings and returns on investment, as well as reduction in waste discharge would increase the company's competitiveness. This finding is in line with the findings of numerous works (Kaynak, 2003; Li et al., 2006; Kannan & Tan, 2005).

Proposition 5: Eco-friendly Sustainable Practices have a significant effect on Ghanaian Manufacturing firms' environmental performance (H5a). GSCM improves an organization's operational performance of Ghanaian Manufacturing firm's (H5b).

Proof of Proposition 5: Table 5 shows a strong positive connection between GSCM adoption and environmental implementation. Eco-friendly management techniques create a significant positive impact on companies' environmental performance. This is such that a percentage increase in GSCM would substantially improve environmental performance (β_{5b} = 0.84; p< 0.001). The research also showed that GSCM enhances an organization's operational effectiveness. The coefficient score (β_{5b} =0.82, p < 0.001) reflected this relationship between eco-friendly practices and operational performance. This confirms the findings of Cousins et al. (2006) and Zhu et al. (2008) for H5a, and Tsoulfas and Pappis (2008) and Zhu and Sarkis (2004) for H5b.

5. Conclusion

The study hypothesized several relationships between SSCM practices (for example, environmental management, operations, and eco-friendly supply chain practices for manufacturing firms and SSCM performance measures (environmental, operations, and competitiveness). Some of the conclusions corroborate those of previous studies, while others go contrary to early findings. The results from rigorous statistical testing aid in the development of hypotheses about the numerous aspects of SSCM. The study's assumptions and subsequent confirmation strengthen the established theory of SSCM from the viewpoint of Ghanaian organizations. However, the unsupported theories have shown a new dynamism in terms of contextual variables. This demonstrates that the validity of many assumptions is conditional on the environment of the developing or established economy in which the companies were sampled and the maturity of the SSCM techniques implemented by each company. Additional research from the perspective of other emerging countries is required to substantiate these claims. The research has several drawbacks. First, the sample size of informants from various sectors is not consistent, which may tilt the study's findings to be bias toward a specific industry. Second, the firms selected represent a diverse range of industries. The maturity of SSCM processes varies significantly across various kinds of businesses, and as a result, respondents' perceptions also differ considerably across these sectors. The research attempted to generalize the results based on answers from several sectors.

Table 5. Hypothesis Testing and Decision

Hypothesis	Relationship		Path coefficient	SE	t-value	Sig-value	Hypothesis Decision
H1a	EMP $\longrightarrow$	SENP	0.86	0.23	19.715	***	Fail to Reject
H1b	EMP $\longrightarrow$	SECP	0.81	0.27	14.688	***	Fail to Reject
H2a	OP $\longrightarrow$	SECP	0.87	0.26	13.483	***	Fail to Reject
H2b	OP $\longrightarrow$	COMP	0.87	0.29	16.517	***	Fail to Reject
H3	EMP $\longrightarrow$	COMP	0.85	0.35	15.426	***	Fail to Reject
H4	ECP $\longrightarrow$	COMP	0.86	0.21	19.801	***	Fail to Reject
H5a	ECP $\longrightarrow$	SENP	0.84	0.26	18.101	***	Fail to Reject
H5b	ECP $\longrightarrow$	SECP	0.82	0.31	15.213	***	Fail to Reject

*** Statistical significance (p = 0.05)

Probably, the results would have shown a more consistent trend, if the investigation had been limited to a few distinct industries and responses gathered from solely companies that fall within the sector. Third, the present study did not examine any significant variations in respondents' perceptions of various sectors. Additionally, it did not investigate any potential substantial variations in respondents' perceptions of companies of varying employee count or yearly revenue.

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Role of Football in International Business and Economy

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Abstract: Football events are one of the most significant sports events globally while football is one of the most popular sports. Thus, the football industry and football-related businesses plays an important role in trade and economy. In the current study key events and top associations and organizations of the football industry are identified, and their role beyond playing grounds is observed. Also, the role the football industry plays in the economic and financial developments of nations, brands and organizations and individuals is highlighted. A comprehensive chart has been drawn that presents a comprehensive structure of the global football industry and also identifies key sources of revenue and expenditures. The study is important for scholars interested in sports economics and sustainable economic development through sports.

1. Introduction

Some countries have oil or rare earth, while others have sports. Natural resources do play an important role innations' socio-economic development however, scarcity of natural resources does not prevent us from looking to other avenues for revenue. Sport is one such avenue for many nations in the world. Sport, though it is a source of health and peace, is also a stimulus for many economies and organizations. Approximating sports' economic value to the world trade and economy is difficult, but if one looks at the fact that European countries have imported sporting goods equal to €13.3B and exported around €11.7B in 2019 (Eurostat, 2021), it is not difficult to visualize the size of the sports industry.

What is the most popular sport? Many argue that it is football. Football is also called soccer in some countries, such as the United States of America. The Fédération Internationale de Football Association (FIFA) was founded in 1904 in Paris with only 7 European authorities, and today is the most well-known face of the football industry (Simon et al., 2019). Today, the association has 211 member associations in it. Also, there were 250 million active footballers worldwide (FIFA, 2001). Thus, there is no wonder in the fact that the football world cup is the most-watched tournament in the world. Football World Cup 2018, held in Russia, had 3.57 Billion viewers around the globe (FIFA, 2018c).

Football in many ways contributes to international business, trade, and economy. For instance, the production of sports products, ticket sales, salaries of football players, broadcasting rights are

just a few dimensions of football economics. Globalization is deeply associated with football in many ways, from international players to international organizations. However, the literature review suggested that despite the importance of the football industry for an economy and population, a comprehensive study of the global football industry's role in international trade and economy has rarely been studied. To fill this gap, the current study was undertaken.

The current study will study the football industry at different levels, clubs, leagues and tournaments, associations, brands, and broadcasting. Each of them is significant in the modern football industry and has a distinct role to play. The study will start from the team-level football industry (clubs and national teams) then will study the business of the leagues and associations. Finally, a bigger picture will be presented.

The rest of the study is organized as follows. The second section presents an overview of the football industry. In this section the business of the professional football industry is explained with examples, starting from the football clubs. The third section presents how the football industry serves a nation in light of nations' socio-economic development. In the third section, one of the biggest international football development programs is explained from an economic perspective. Lastly, the study is concluded with important insights and implications.

2. Overview of Football Industry

Football was a product of transnational connections and free trade (Lanfranchi & Taylor, 2001). Mendoza (2017) argued that a country's GDP per capita and Human Development Index both are highly dependent on FIFA ranking. Gásquez and Royuela (2014) suggested that in the absence of complete information, FIFA ranking can complement our understanding of the development in those countries. For instance, Japan, Qatar, and China lead Asian football in many ways (FIFA, 2021c), and they are all wealthy countries.

The football industry is a Billion Dollar industry that creates facilities, workplaces and brands. One main concept is that organizations can create clubs while the associations usually collect players for the national team. From fan watching a match to player transferring are all business. Overall, European football was the role model for other countries' football development. However, some other continent nations are in the process of building their giant industry such as Japan and China. The J1 League of Japan was founded in 1992 by Japan's football association, and they plan to become a world champion (Manzenreiter & Horne, 2018, pp. 639-657). Besides, football fans in China have already reached 100 Million (Duerden, 2019).

Brands play an important role in football as both benefit from each other. Sportswear manufacturers like Nike and Adidas compete to get licenses. Adidas produces the most famous balls. On the other hand, Nike contracts with more players. Nike's strategy involves nourishing young talent while Adidas strives to nourish the charisma of the ball. Meanwhile, different nations are also benefiting from the industry, such as Pakistan producing more than half of the world's football balls while employing around 60,000 people (Cooper & Molloy, 2020). In the following sections, important stakeholders of the football industry are discussed.

2.1 Clubs, and national teams

Football clubs are the most important part of the football industry, and they have multiple ways to produce revenues for the clubs and their owners. First of all, the traditional method of selling tickets and jerseys and even some tours are available to the well-known clubs home stadiums such as Santiago Bernabeu, Nou Camp, and Wembley, the home of the English national football team.

Secondly, brands and sponsors are keen to cooperate with the clubs and teams since it's one way of advertisement and additional sale. Five times winner (the most) of the World Cup, Brazil national football team wears a Nike jersey for a reason, they made the biggest deal for a national team side in 1996, a £100m contract between the Brazilian Football Confederation (CBF) and Nike (Reuters, 2015).

Nowadays, many billionaires are interested in football clubs, that's why many top European clubs have foreign owners from different continents. For example, one of the giant clubs of Europe, Manchester City is owned by Sheikh Mansour, who is a member of the royal family from Abu Dhabi and the deputy prime minister of the United Arab Emirates. Another billionaire Zhang Kanyang was born in Nanjing and is the son of Zhang Jindong, the founder of Suning (Reuters, 2019b). 21% of top European clubs are owned by Asians, as shown in Table 1.

While some clubs solve their economic problem by finding new owners or getting sponsorships from different brands, small clubs found their solution by developing young talents into superstars and selling them to the rich clubs. The most expensive player transfer in history was Neymar Jr from Barcelona to Paris Saint Germain (PSG) with a cost of $263 Million for a transfer fee and a five-year contract with a $350 million salary to the player (Hayward, 2017). It should be noted that the transfer fee is "the amount of money that a sports team pays to buy a new player from another team" (Cambridge Dictionary, 2021).

How much is a club worth if a single player can be worth hundreds of millions of US dollars? Some clubs are owned by citizens of the city or a country, where it's valued as their symbol. Table 2 shows the most valuable football clubs in the world. The best spot had been monopolized by two groups for the past 16 years, with the Real Madrid side taking it five times and England's Manchester United leading 11 times. Since the last time when Forbes announced the list in 2018, the top 20 club's value has increased by 30% on average (Ozanian, 2021).

Interestingly, football clubs (FCs) income changes due to their victories and actions. Even one player transfer can play a big role in the club's future. As mentioned before, Neymar Jr was the biggest transfer either in the transfer fee or role in the next few years. His ex-club FC Barcelona suffered in European competitions in the next few years without Neymar Jr. Table 3. That's why the Catalan pride (FC Barcelona) couldn't catch their rival Real Madrid CF's revenue for years, except 2021, concluding from Table 3. In contrast, Neymar helped his new club PSG get more TV rights and fans. In short, people wanted to see Neymar, so they bought PSG tickets and products. Even the French top division received more TV broadcasting offers than the previous year.

Table 1. Number of foreign owners of top division football clubs in Europe in 2018, by origin

Region	Share of foreign owners (by %)
Europe	46
North America	25
Asia	21
Other	8

Source: Lange (2020)

Table 2. Most valuable football clubs in the world

Logos	Rank	Name	Value	Revenue (2020)	Nation
	1	Barcelona	$4.76B	$792 Million	Spain
	2	Real Madrid	$4.75B	$792 Million	Spain
	3	Bayern Munich	$4.22B	$703 Million	Germany
	4	Manchester United	$4.2B	$643 Million	England
	5	Liverpool	$4.1B	$619 Million	England

Source: Forbes (2021c)

2.2 Leagues and tournaments

The national teams and clubs have separate meanings in the case of organizing. Clubs pay the player's salary, making a contract of constant training with specific demands. On the other hand, national teams are allowed to gather in a specific duration between the league matches.

The most popular international football tournament is the World Cup organized by FIFA because people see the victory in this competition as a matter of the nation's glory. Famous players and referees choose FIFA World Cup rather than the Olympics football, making the Jules Rimet Trophy (World Cup Trophy) more important than the Olympics gold medal. Hence, many advanced economies always try to host the World cup. The last time France won the tournament was when the World Cup was hosted in Russia in 2018. USA, Mexico and Canada decided to host the 2026 world cup during the 68th FIFA conference held in Moscow in 2018. While Qatar, a rich Arab country, is about to host for the first time in 2022 (FIFA, 2018b). Only 3 examples of last and next world cup host nations can show the interest of the states. Those states are willing to host because the competition can bring millions of tourists, and sell hundreds of broadcasting rights. From Table 4, the international football development is visible, the first World Cup had 13 qualifying nations, while the 2022 World cup included 211 nations in its qualifying stage.

Table 3. FC Barcelona and Real Madrid CF's European success and operating income

Season	Barcelona Success in UCL	Barcelona's Operating Income[2]	Real Madrid Success in UCL	Real Madrid's Operating Income[2]
2015[1]	Winner	174	Semi-final	170
2016[1]	Quarter-final	108	Winner	162
2017[1]	Quarter-final	102.1	Winner	181
2018	Quarter-final	111	Winner	94
2019	Semi-final	-37	Round of 16	112
2020	Quarter-final	-	Round of 16	-
2021	Round of 16	62	Semi-final	92

[1]Year when Neymar Jr was at FC Barcelona.   Source: Forbes (2021a, 2021b), TransferMarkt (2021a, 2021b)
[2]All incomes are in Million USD.

Table 4. List of the World Cup hosts, winners and balls until 2022

Year	Host nation	Winning nations	Balls	Qualifying nations
1930	Uruguay	Uruguay	Tiento, T-model	13
1934	Italy	Italy	Federale 102	32
1938	France	Italy	Allen	37
1950	Brazil	Uruguay	Duplo T	34
1954	Switzerland	West Germany	Swiss World Champion	45
1958	Sweden	Brazil	Top Star	55
1962	Chile	Brazil	Crack	56
1966	England	England	Challenge 4-Star	74
1970	Mexico	Brazil	Telstar	75
1974	West Germany	West Germany	Telstar Durlast	99
1978	Argentina	Argentina	Tango	107
1982	Spain	Italy	Tango España	109
1986	Mexico	Argentina	Azteca	121
1990	Italy	West Germany	Etrusco Unico	116
1994	The United States	Brazil	Questra	147
1998	France	France	Tricolore	174
2002	South Korea, Japan	Brazil	Fevernova	199
2006	Germany	Italy	Teamgeist	198
2010	South Africa	Spain	Jabulani	206
2014	Brazil	Germany	Brazuca	203
2018	Russia	France	Telstar 18	210
2022	Qatar	(Pending)	(Pending)	211

Source: FIFA (2013a, 2021e, 2021g)

As aforesaid, just like the most valuable FCs are from Europe their associations and competitions are the most viewed and most famous at the club level. The Union of European Football Association's (UEFA) UEFA Champions League (UCL) is the most famous tournament that is held between the clubs, as 380 million people watched the UCL Final match in 2014 (Ashby, 2014). It was a match between two Spanish giants Real Madrid C.F against Club Atlético de Madrid held in Lisbon, Portugal.

Almost every country has its national leagues. Among them, the English Premier League (EPL) is known the most. The reason is their high-level football with a lot of competition, in other words, the league's teams level are close to each other, and that level average is top class. One of the main objectives of the EPL is to make the most competitive league with world-class players (Premier League, 2021a).

From Table 5, one can see that Manchester United are leading the list of revenue even though they finished 6th in the season of 2018/19. On the other hand, Manchester City won the EPL in the same season (Premier League, 2019a), positioning 2nd on the revenue table. This shows that Manchester United's income is from the sponsorships and their fans all around the world. They have 142 million social media followers (Goal, 2021). EPL clubs are creating around 100,000 jobs and supporting football development all over the world (Premier League, 2021b). EPL organization also supports its clubs' operations economically by paying them from the broadcasting and other revenues. Table 6 shows the 2018/19 season payments to the clubs from the league. Table 6 shows that league position can be related to the payment, Manchester City and Liverpool lead the table with 1st and 2nd position, respectively. Also, they're the most paid on this list. However, most of the teams are paid close enough, where the number of teams who got £120 million and above is 10- half of the league's total clubs.

2.3 Associations

As previously mentioned, FIFA is the biggest association in football, having 211 member associations. Also, FIFA supports its members through numerous programs, even helping financially to the associations and countries. 6 international organizations are members of FIFA.

Table 5. Premier League clubs and their three attributes in the 2018/19 season.

Club Name	Revenue (in million £)	League position	Wage/Revenue ratio (%)
Manchester United	627	6	56
Manchester City	538	1	59
Liverpool FC	533	2	58
Tottenham Hotspur	459	4	39
Chelsea	452	3	70
Arsenal	393	5	60
West Ham United	193	10	70
Everton FC	188	8	85
Leicester City	179	9	83
Newcastle United	176	13	55
Wolverhampton	172	7	53
Crystal Palace	154	12	78
Southampton	150	16	77
Watford	147	11	57
Brighton & Hove Albion	143	17	71
Burnley	139	15	62
Fulham	137	19	67
Bournemouth	131	14	85
Cardiff City	125	18	43
Huddersfield Town	122	20	53

Source: Deloitte (2020), Premier League (2019a)

Table 6. Premier League payments (£) to clubs 2018/19 season

Clubs	UK Live	Equal Share	Facility Fees	Merit Payment	International TV	Central Commercial	Total Payment
Manchester City	26	34,361,519	30,104,476	38,370,360	43,184,608	4,965,392	150,986,355
Liverpool	29	34,361,519	33,461,785	36,451,842	43,184,608	4,965,392	152,425,146
Chelsea	25	34,361,519	28,985,373	34,533,324	43,184,608	4,965,392	146,030,216
Tottenham Hotspur	26	34,361,519	30,104,476	32,614,806	43,184,608	4,965,392	145,230,801
Arsenal	25	34,361,519	28,985,373	30,696,288	43,184,608	4,965,392	142,193,180
Manchester United	27	34,361,519	31,223,579	28,777,770	43,184,608	4,965,392	142,512,868
Wolverhampton	15	34,361,519	17,794,343	26,859,252	43,184,608	4,965,392	127,165,114
Everton	18	34,361,519	21,151,652	24,940,734	43,184,608	4,965,392	128,603,905
Leicester City	15	34,361,519	17,794,343	23,022,216	43,184,608	4,965,392	123,328,078
West Ham United	16	34,361,519	18,913,446	21,103,698	43,184,608	4,965,392	122,528,663
Watford	10	34,361,519	12,198,828	19,185,180	43,184,608	4,965,392	113,895,527
Crystal Palace	12	34,361,519	14,437,034	17,266,662	43,184,608	4,965,392	114,215,215
Newcastle United	19	34,361,519	22,270,755	15,348,144	43,184,608	4,965,392	120,130,418
AFC Bournemouth	10	34,361,519	12,198,828	13,429,626	43,184,608	4,965,392	108,139,973
Burnley	11	34,361,519	13,317,931	11,511,108	43,184,608	4,965,392	107,340,558
Southampton	10	34,361,519	12,198,828	9,592,590	43,184,608	4,965,392	104,302,937
Brighton & Hove Albion	13	34,361,519	15,556,137	7,674,072	43,184,608	4,965,392	105,741,728
Cardiff City	12	34,361,519	14,437,034	5,755,554	43,184,608	4,965,392	102,704,107
Fulham	13	34,361,519	15,556,137	3,837,036	43,184,608	4,965,392	101,904,692
Huddersfield Town	10	34,361,519	12,198,828	1,918,518	43,184,608	4,965,392	96,628,865
Total		£687,230,380	£402,889,186	£402,888,780	£863,692,160	£99,307,840	£2,456,008,346

Source: Premier League (2019b)

The AFC in Asia, CAF in Africa, the Football Confederation (CONCACAF) in North and Central America and the Caribbean, CONMEBOL in South America, Union of European Football Associations (UEFA) in Europe and the OFC in Oceania are regional officials that focus on the development of football, football tournaments alongside FIFA (FIFA, 2021f). Football associations make the regulations and officials of the matches such as refereeing, appointing.

Table 7 shows us that FIFA's strategy in the budget has changed after the 2014 World Cup. From the South Africa World Cup 2010, they had positive results every year until 2014, and then they were putting more expenses than the revenue to get a higher profit from the 2018 World Cup. Moreover, the difference between a year without World cup and a year with World cup is smaller before 2015, such as the $69Million profit difference between FIFA's 2014 and 2013 net financial result. While the year 2018's profit, when the World Cup in Russia was held, has a $2004Million profit difference from the year 2017's net financial result (see Table 7).

The 2018 World cup brought the highest revenue to FIFA in World Cup history. Ticket sales, broadcasting rights, hospitality rights, and marketing rights all exceeded their budget targets and contributed to the highest revenue. As the FIFA statement claims, the revenue is $5,357 million covers the full 2015-2018 financial cycle from the World Cup 2018. The average attendance of

Table 7. FIFA's revenue, reserves and expenses by year (in Million USD)

Year	Revenue	Expenses	Reserves	Financial result before taxes	Net financial result for the year
2010*	1,164	-1,039	1,280	125	202
2011	1,040	-1,012	1,293	28	36
2012	1,077	-1,000	1,378	77	89
2013	1,383	-1,236	1,432	147	72
2014*	1988	-1,798	1,523	190	141
2015	544	-661	1,410	-117	–52
2016	502	-893	1,048	-391	–368
2017	734	-923	930	-189	–191
2018*	4,641	-2,891	2,745	1,750	1,813
2019	765	–1,046	2,585	–280	–185
2020	266	–1,044	1,880	–778	–683

*World Cup Year.   Source: FIFA (2011, 2012, 2013c, 2014, 2015, 2019, 2020, 2021d)

98.2% stadium capacity was remarkable. The total number of people who attended matches was 3,031,768. In addition, World Champion France received $38 Million as a prize for winning the World Cup (FIFA, 2019, p. 34-41).

Throughout the history of football, European football leagues and tournaments have been more famous than the other continents. Why is it in Europe? Because, modern football method was firstly invented in England moreover, 7 European national teams are in the top 10 of FIFA's ranking (FIFA, 2021c). The mentionable continent is, of course, South America having the countries that have 9 world cup trophies between, also street football is found everywhere in some countries. One example is the five-times World Cup winner (the most) Brazil. It is called a country of football for a reason. The largest attendance at a single football match was 173,850 for the match between Uruguay versus Brazil to decide the World Cup winner. That historical match was at Maracanã Stadium in Rio de Janeiro, Brazil, on 16 July 1950 (Guinness World Records, 2021).

However, Germany and Italy each have 4 world cup titles, France two, England and Spain having one each makes a total of 12 times the world cup winners from Europe, which is the most successful continent. UEFA and its plans are role models for other countries since the most famous club football competitions are in Europe too (UEFA, 2021a; 2021b).

Table 8 shows that UEFA's revenue is even greater than FIFA's even though FIFA is the biggest governing body of football. For instance, the revenue of UEFA between 2015 to 2018 was

$$(€2099.4 + €4579.8 + €2835.9 + €2789.8)Million = €12304.9Million \text{ (Table 8)},$$

and the revenue of FIFA in the same period was

$$(\$544 + \$502 + \$734 + \$4641)Million = \$6421Million \text{ (Table 7)},$$

which is approximately €5234Million (calculated by May 31, 2021's USD/EUR exchange rate).

Following its high revenue, UEFA also spends a lot on the development of football, because their main objective is to invest as much as possible in European football. Unfortunately, the Euro 2020 competition for European champion of national teams is postponed to 2021's summer due to the covid-19 pandemic. Despite the threat from coronavirus, UEFA managed to run the football domestic leagues and UCL during this hard time. UEFA created a Return To Play Protocol that built up operational and restorative rules for organizing around 1,500 matches and executing more than 125,000 COVID-19 tests since August 2020 (UEFA, 2021c).

Corruption is another issue affecting the revenue of associations. In February 2016, former general secretary of UEFA, Gianni Infantino was elected as FIFA's president to restore FIFA's image after the 2015 FIFA corruption scandal (BBC, 2016). If we look back at the key events of punishing the guilty executives of FIFA, we may start with the 27th of May 2015, when seven officials of FIFA, were arrested in Zurich by Swiss police. Under the Federal Bureau of Investigation's scrutiny, several FIFA officials and two continental authorities, which are from CONCACAF and CONMEBOL, were all charged with things like "racketeering, wire fraud, and

money laundering conspiracies." On December 21, the FIFA Ethics Committee banned both Sepp Blatter (ex-president of FIFA) and Michel Platini (ex-president of UEFA) for eight years from all football-related activities organized by FIFA (Onwumechili & Bedeau, 2016).

2.4 Brands

If clubs and associations are responsible for managing the football matches and tournaments, how do they gain other than ticket sales and merchandising? The answer is sponsors and brands that are from other departments. The most famous among them are Coca-Cola and Pepsi, while Coca-Cola cooperates with FIFA World Cup while their competitor Pepsi is sponsoring UEFA Champions League for many years. When it comes to Football kits and gears manufacturing, Adidas and Nike are dominant producers and sponsors in the football world. Firstly, some examples of sponsorships will be mentioned with some data, and then the aftermath will be included. In 2020, the world economy was hurt by the pandemic, and the countries had no choice but to lock down their people to minimize the spread of the virus, resulting in the curb of outdoor activities, including Football events. Thus, along with the tourism and traveling industry, the Football Industry was another victim of this pandemic period (Gopinath, 2020). Following the COVID-19 induced economic disruptions, most of the companies faced a drop in their sales. Even the largest sportswear manufacturers, Nike and Adidas. Both brands had revenue of $66 billion combined Nike's sales dropped by around 4.3% in 2020, while that of Adidas slumped 16%. Table 9 shows the revenue of Nike, Adidas and Puma in recent years.

Puma is the closest competitor to Nike and Adidas, but concluding from the difference of the revenue of Puma and the 2 giants, one can see that Nike and Adidas are dominant in the sportswear industry. Since 1970, Adidas has owned the license of the World Cup official balls. Furthermore, Nike-sponsored players were successful in the 2018 World Cup, such as both finalists, the national teams of France and Croatia, were sponsored by Nike. Also, the golden boot winner (highest goal scorer) Harry Kane, the best young player Kylian Mbappe and the golden ball winner Luka Modric were all sponsored by Nike. Interestingly, some of those world cup awards are named after Adidas because of its partnership with FIFA World Cu example, Adidas Golden Ball is for the best player of the tournament, Adidas Golden Boot is for the top scorer, and Adidas Golden Glove is for the best goalkeeper in the tournament (FIFA, 2021a).

In 2013, Adidas renewed its contract with FIFA until 2030 to be the supplier and licensee rights for the FIFA World Cup. As FIFA claimed, FIFA referees, officials, and the entire youth program wear Adidas products from head to toe whilst they also use the Adidas balls, gears, and workout accessories (FIFA, 2021b)."Over the last 40 years, Adidas and FIFA have worked closely together to develop football worldwide. Therefore, it was a natural step for us to extend one of the most successful partnerships in the history of sports marketing", CEO of the Adidas Group Herbert Hainer said in 2013 when he was attending the ceremony with FIFA Marketing Director Thierry Weil in Moscow (FIFA, 2013b). The previous statement clarifies the importance of cooperation between the football associations and brands. It's not possible to calculate the exact amount of the expenses on football from the brands because most companies don't announce every contract with clubs and associations. While only some are revealed to the public, such as deals between the famous clubs and brands are known. Let's see the most valuable kit deals in the world according to the reliable news publishers of Europe such as Reuters, since the real contract details are announced publicly by neither the club nor brand. Table 10 shows the most expensive kit license deals in football's history.

In short, sportswear manufacturers pay for the license rights for using the football club. The reason is that the products belong to the manufacturer. Depending on the contract between the parties, clubs can gain from each sale; for instance, Liverpool's deal with Nike mentions that 20% of the sales commission goes to Merseyside (Liverpool) (Metro, 2020). That makes real sense, both clubs and brands can benefit from the shirt sales. On the other side, fans will receive the finest products from their favorite club. This logic is identical with national teams, where the associations

Table 8. UEFA's revenue, expenses, matches played & UCL prize and winners (in Million EUR)

Season	Revenue	Expenses	Net Result (after solidarity payments)	Matches Played	UCL Winner Prize	UCL Winner Club
2018/19	3857.2	-3638.6	-46.4	2354	111.1	Liverpool (ENG)
2017/18	2789.8	-2515.2	-5.0	2090	88.7	Real Madrid (ESP)
2016/17	2835.9	-2558.4	-6.7	2073	81.1	Real Madrid (ESP)
2015/16	4579.8	-3310.2	3.8	2089	80.1	Real Madrid (ESP)
2014/15	2099.4	-1976.6	102.1	1992	61	Barcelona (ESP)
2013/14	1730.4	-1614.6	-27.9	1891	60.4	Real Madrid (ESP)
2012/13	1698.9	-1575.7	-42.4	1662	56.6	Bayern Munich (GER)
2011/12	2795.7	-2059.2	128.8	1868	62.9	Chelsea (ENG)
2010/11	1384.1	-1308.7	-85.9	1890	53.2	Barcelona (ESP)

Source: UEFA (2012, 2013, 2014, 2015, 2016, 2017, 2018a, 2018b, 2019)

Table 9. The Revenue of Nike, Adidas and Puma in recent years

	2020*	2019	2018	2017	2016	2015	2014	2013	2012	2011
Nike	33.6	35.13	31.35	30.57	29.1	27.51	24.99	22.75	20.97	18.08
Adidas	19.8	23.64	21.92	21.22	18.48	16.92	14.53	14.2	14.88	13.32
Puma	5.2	5.5	4.65	4.14	3.63	3.39	2.97	2.99	3.27	3.17

*The pandemic year.   Source: Sabanoglu (2021)
Note: All revenues are in Billion Euros.

Table 10. Most expensive kit license deals in football

Clubs	Club's origin	Brands	Deal worth per year (Million £)	Contract starting year	Source
Barcelona	Spain	Nike	140	2018	Skysports (2016)
Real Madrid	Spain	Adidas	120	2020	Reuters (2019a)
Manchester United	England	Adidas	75	2015	Wilson (2014)
Paris Saint-Germain	France	Nike	75	2019	Johnson (2019)
Manchester City	England	Puma	65	2020	BBC (2019)
Arsenal	England	Adidas	60	2019	Reuters (2018)
Chelsea	England	Nike	60	2017	Wilson (2016)
Juventus	Italy	Adidas	46	2018	Shergold (2018)
Bayern Munich	Germany	Adidas	43	2016	Akerman (2015)
Liverpool	England	Nike	30	2020	Metro (2020)

cooperate with manufacturers. Table 11 shows ten best-selling football jerseys by a club in the 2018/19 season.

There are sponsors who don't work in the football industry, including the Fly Emirates, Samsung etc. Companies do marketing by putting their names or logos on the jersey of the football clubs. They are usually companies of oligopoly markets, where it demands advertising a lot. Because football is the most-watched sport, as mentioned earlier, 3.5 Billion people watched at least 1 minute of the FIFA World Cup (FIFA, 2018c), so it is a great advertising opportunity. Some are equivalent to advertisements in the movies. Batman drives Mercedes Benz, while Real Madrid players drive an Audi car. Table 12 shows most expensive sponsorships on the shirt of football clubs.

The origin countries of the sponsors and clubs intimate how intercontinental the sponsorship business can be. 100% of the clubs are from Europe, however, only 4 out of 10 sponsors are from Europe.

Table 11. Ten Best-selling football jerseys by a club in the 2018/19 season

Clubs	Manchester United	Real Madrid	Bayern Munich	Barcelona	Liverpool	Juventus	Chelsea	Borussia Dortmund	Paris Saint-Germain	Manchester City
In 1000 Units	3250	3120	2575	1925	1670	1615	1525	1205	1146	1085
Manufacturer	Adidas	Adidas	Adidas	Nike	New Balance	Adidas	Nike	Puma	Nike	Nike

Source: Statista (2020)

Table 12. Most expensive sponsorships on the shirt of football clubs

Clubs	Club's origin	Sponsors	Sponsor's origin	Annual Worth (in Million £)
Real Madrid	Spain	Emirates	UAE	60
Manchester United	England	Teamviewer	Germany	47
Barcelona	Spain	Rakuten	Japan	47
Paris Saint-Germain	France	Accor	France	43
Chelsea	England	Three	Hong-Kong	40
Manchester City	England	Etihad Airways	UAE	39
Bayern Munich	Germany	T-Mobile	Germany	36
Liverpool	England	Standard Chartered	England	27
Arsenal	England	Emirates	UAE	26
Tottenham	England	AIA	China	25

Source: Fraser (2021)

2.5 Broadcasting and other contents

Football competitions were established before television became popular. For instance, the first World Cup was organized in 1930 (see Table 4), while the first-ever regularly scheduled TV service of BBC started in 1936 (BBC, 2021). In modern times, broadcasting is one of the main parts of the football industry. Because this is the tool to reach the people. 3.5 Billion people couldn't watch the World Cup without broadcasting due to the limited capacity of stadiums.

GermanBundesliga's average attendance rate was 42,738 in the 2018/19 season that brought 12.9% of the revenue. And 66.1% of the revenue in the same season came from broadcasting rights and other media-related revenues to the DFL, the association that organizes the Bundesliga of Germany (Horky, 2020).

Broadcasting rights will include some sponsorship content too, for instance, Lays and Heineken advertisements usually run with the UCL matches. Moreover, broadcasting rights price will depend on the size and region of the broadcaster. That's fair since bigger TV channels gain more, while smaller ones will broadcast the tournaments for improvement. The tournament or league organisers will give the media the right licenses. 4 types of media licenses (TV, Radio, Mobile and Internet) were given to broadcasters for the 2018 World Cup.

Broadcasting was the biggest source of revenue (55%) for FIFA in the 2015-2018 cycle. 2018 World Cup was broadcasted to 220 territories and contributed 95% of the full cycle's (2015-2018) media revenue of $3,127 Million. Table 13 shows the FIFA revenue split between 2015 and 2018. Another fact was that Asian and North African territory exceeded Europe by their revenue brought to FIFA for the first time in history. That was $974 Million in revenue from TV broadcasting rights (FIFA, 2019) was remarkable because it shows the development of the continent and the development of football broadcasting around the world. Table 13 shows FIFA revenue from 2015 to 2018.

There are other contents except for the match, such as pre-game shows, cinematic content made by the TV channels, but they follow the standard of media that the tournament organizers have set. Having the same format is very important when it comes to creating content worldwide. Following the e-business rise, even clubs and player have their digital content channels on the internet recently. For instance, the FC Barcelona YouTube channel had 3.7 Million subscribers (the

Table 13. FIFA revenue split 2015-2018 (in Million USD)

Source types/Years	2015	2016	2017	2018	Total
Television broadcasting rights	258	96	229	2,544	3,127
Marketing rights	157	115	245	1,143	1,660
Licensing rights	51	204	160	185	600
Hospitality/accommodation rights and ticket sales	0	0	23	689	712
Other revenue	78	87	77	80	322
Total	544	502	734	4,641	6,421

Source: FIFA (2019, p. 17)

most) as of February 2018, but they have 11.5 Million subscribers (the most) as of June 2021 on the same platform. As seen in Table 2, FC Barcelona is the most valuable football club, and its online channel and contents are one of the leading examples of online media advertisement. Their sponsor Rakuten (a Japanese company) is visible on their YouTube channel's featured channel part. Moreover, contents also include advertisements, which are watched by millions of people (YouTube, 2021).

3. Football and International Economy

3.1 Football and the socio-economic development of nations

This section will highlight how nations benefit from the football industry and how some couldn't use the opportunities they had. As said before, in the leagues and tournaments section, the top tier tournaments have become clear by their quality and popularity. First of all, the FIFA World Cup, UEFA Champions League, and UEFA European Championship are the main events that bring the highest benefit to the countries. The World Cup is a powerful way to attract tourists, tourists that will expend a pretty good amount of money during the visit time. For instance, there are costs for travelling, food and drink, hotel or hostel, and the foreigners might do shopping during the time. Not every tourist that comes during the sports events is going to buy a ticket for the event. However, the amount of people purchasing a ticket is convincing.

According to FIFA (2018a), 11 cities of Russia hosted the 2018 World Cup and welcomed 7.7 million domestic and global visitors during the events. The capital city Moscow achieved the best attendance with 1,887,200 visitors. For the 2014 FIFA World Cup™ in Brazil, the top venue Rio de Janeiro had 937,330 visitors in total and 5.2 million visitors overall in the country. Frankly speaking, Brazil hosted 2 mega-sport events in a row that are 2014 FIFA World Cup and the 2016 Summer Olympics to increase tourism and boost the economy. Brazil's receipt from foreigners has increased by 548 Million USD during the 2014 World Cup while rising again in 2016 during the Olympic games with an amount of 472 Million USD (Meurer & Lins, 2017). This case is evidence that the football World Cup had higher support than the Olympics in Brazil.

Before the Brazil World Cup, South Africa FIFA World Cup was crucial not only to South Africa but also to the Africa continent. More than 15,000 media arrivals were recorded in that 2010 World Cup. Also the Waka Waka (The Official 2010 FIFA World Cup™ Song) is the most popular football song with 2.8 Billion views on YouTube by now. The 2010 World Cup showed Africa's culture very well and became iconic with its differentiation. From Table 14, most of the respondents were from Europe and America. And Africans were just 17.6%, which shows the tourism from other continents were quite higher in South Africa World Cup.

However, some mega-sport events were not successful as planned. The 2004 Athens Olympics in Greece was supposed to increase tourism in the long term and bring a boost to the economy. But it had little to no effect on the economy and tourism industry (Vierhaus, 2018, pp. 3-4).

The Prize pool is another way of gaining through participating in football events. The 2018 World Cup prize winners are shown in Table 15. The most recent World Champion, France's national football team received 38 Million USD total. This prize has been divided between the players and the association itself, respectively. In short words, it just goes to the people of France.

That's equal to 80% of the Tuvalu GDP in 2019, which is 47.27 Million USD according to the World Bank (2021). Table 15 shows prize money for the 2018 FIFA World Cup.

For some countries, manufacturing a specific product or service for the football industry is a source of financial gains and economic development. For instance, Pakistan produces almost 70% of the football, football manufacturing also helps fight unemployment by creating 60,000 jobs in Pakistan (Cooper & Molloy, 2020). Football manufacturing in Pakistan started in the early 1900s under the British colonialists. Since then, the region has produced hand-stitched footballs. Despite the technological development, Pakistan kept producing footballs by hand (and sometimes using child labour), and as a result, China recently took some portion from the football manufacturing space because of its advanced technology. In 2009, China had 50.5% of the market share ahead of the South Africa World Cup; meanwhile, Pakistan only had 13.2% of the market (Tanveer et al., 2012, p. 35). However, Pakistan was the main supplier for the World Cup 2018 and exported around 37 Million footballs that worth approximately \$153Million, which was the highest among the football manufacturing countries in 2018 (Khan, 2020). Those countries are preferred by the sports product giants Adidas, Nike, and others because of the cheaper labor. As a result of the international business, both sides are benefitting in their way.

Football stitching has always been a significant income source in the Sialkot area of Pakistan since the 1900s. Both factory-based, home-based, and centre-based football manufacturing are available in Sialkot and nearby villages. As seen in Table 16, a male worker from home earns monthly a 41.75 Euro, relatively low to the factory-based worker as a factory stitcher who collects 139.17 Euro at the same amount of time (Naz & Bögenhold, 2020).

Table 14. Origin regions of respondents during the 2010 World Cup (in %, n=4814)

Region	Africa	Asia	Australia/New Zealand	Europe	Middle East	North America	South America
Percentage	17.6	8.3	7	37.8	1.2	11	17

Source: Bob and Potgieter (2013)

Table 15. Prize money for the 2018 FIFA World Cup (in Million USD)

Position	Winning Teams	Prize Money
Champions	France	38
Runners-Up	Croatia	28
Third Place	Belgium	24
Fourth Place	England	22
5th-8th Place	Brazil, Russia, Sweden, Uruguay (each)	16
9th-16th Place	Argentina, Colombia, Denmark, Japan, Mexico, Portugal, Spain, Switzerland (each)	12
17th-32nd Place	Australia, Costa Rica, Egypt, Germany, Iceland, Iran, Republic of Korea, Morocco, Nigeria, Panama, Peru, Poland, Saudi Arabia, Senegal, Serbia, Tunisia (each)	8
Total	32 teams	400

Source: FIFA (2019, p. 37)

Table 16. Earnings in football stitching in Pakistan, 2015

Type of Stitchers	**Gender**	**Daily Output**	**Piece Rate (PKR)**	**Monthly earnings (PKR)**	**Monthly earnings (EUR)**
Factory-based stitcher	Male	6	100	15600	138.17
Centre-based stitcher	Male	7	85-110	15470	138.01
Centre-based stitcher	Male	7	75-85	13650	121.77
Family centre (4 members)	Female & Male	12	90-95	28080	250.51
Female stitching centre	Female	3	50	3900	34.79
Homeworker	Male	3	60-65	4680	41.75
Homeworker	Female	3	32-55	3900	34.79

Source: Naz and Bögenhold (2020)

3.2 Football development and FIFA

Because FIFA is a governing body of football, the association also needs to invest in the development of football all around the world. As shown in Table 7, FIFA had 6,421 USD revenue from the events they organized, licensing rights, and other sources in the 2015-2018 cycle. Also, 81% of that revenue was invested in the football community differently. One of their main programs is FIFA Forward Programme, which is a support to FIFA's 211 member associations and the regional associations. After promising World Cup in 2018, FIFA decided to increase the investment to their member associations through the Forward 2.0 Programme in the 2019-2022 cycle (FIFA, 2019, p. 40-57). Figure 1 displays the FIFA Football Development Programmes sizes since 2011 and the planned budget until 2022.

4. Discussion

Based on the preceding discussions and literature reviewed, the current study proposes a comprehensive structure of the football industry (see Figure 2). Figure 2 shows that the payments and cooperation flow between the important parts that are compounding the football industry. For instance, Football players are paid by the Clubs and Sponsors. For Associations, this includes all the FIFA member associations and Figure 2 is not intending to show the structure of associations. Instead Figure 2 is more focused on the business compounding parts of the football industry. In Figure 2, arrows are the direction of the action they're doing. For instance, football clubs participate in the leagues and tournaments and get paid by the organizer associations. The reason to say that associations and clubs are cooperating is that most of the stadiums are owned by the clubs. So those clubs help with their stadiums to hold the matches, but they get paid in return. In rare cases, national teams have their independent stadiums. However, most of the stadiums are owned by the clubs.

Moreover, Fans or Customers are paying for the service or product they are getting, such as watching a live football match on TV, buying sportswear from the sponsor's shops. To note, both sports brands and non-football industry sponsors are included in the Sponsor Brands section. So Adidas and Rakuten are both counted in the same section, for example. Also, any type of sponsoring is included in the Sponsors section, such as TV broadcasters can have a deal with players or clubs to make content and sell. So in Figure 3, the TVs and broadcasters box includes only the cooperation between the leagues and tournament contents with broadcasters. Broadcasting brings the most of the revenue from football content. While other types of football

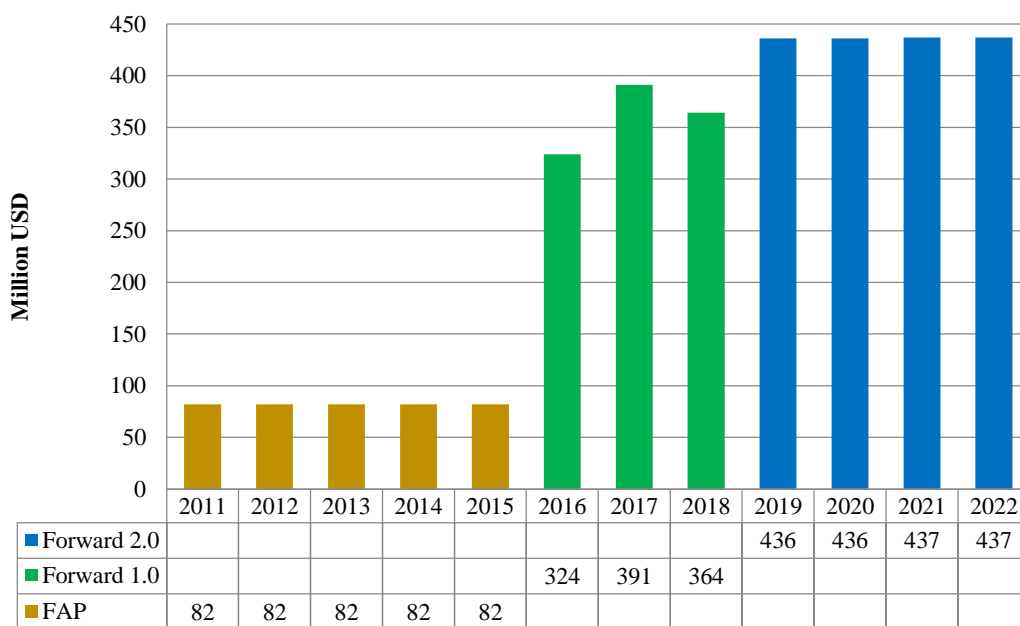|	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
■ Forward 2.0									436	436	437	437
■ Forward 1.0						324	391	364				
■ FAP	82	82	82	82	82							

Figure 1. FIFA Football Development Programmes size 2011-2022 (Million USD) (Data: FIFA, 2019, p. 45)
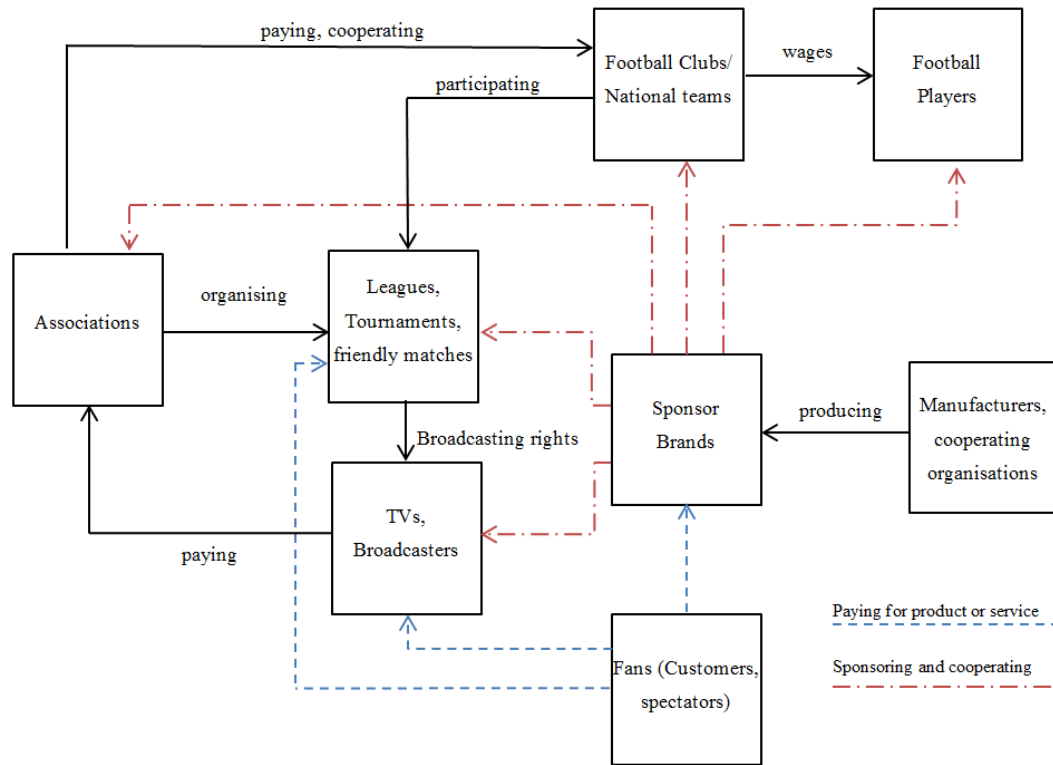
Figure 2. The structure of the global football industry

content that are related to individual players and clubs are included in the Sponsor Brands. Films such as Ronaldo [2015] and Toni Kroos [2019] are works of independent film producers and organizations outside of football broadcasting.

Guided by the literature reviewed in the current study, an overview of the so-called "toppers" in different categories of the football industry is presented in Table 17 for quick reference for the readers. Noticing from the research data, the names of the top associations and clubs don't frequently change through history because they are top-tier clubs and the main subjects of football for years. Some clubs are trying to become a brand like them with many financial sources from outside the industry, such as Manchester City in the list, whose owner is an Arab Sheikh, as mentioned before. On the other hand, top sponsors are always changing because of the change in the global market. In addition, 5 out of 8 sponsors are from Asia in this list, showing the recent economic rise of Asian countries.

5. Conclusion

Balancing economic growth with the needs of society and the environment is at the heart of sustainable economic development (Javed et al., 2021). Through investment in sports, countries not only provide their citizens with opportunities to stay healthy but sports in turn also becomes a source of revenue for the countries connected with it. One can argue that sports success is related to its nation's development. But financially independent people tend to spend more time on their hobbies, such as football. Another thing is that good governance brings top-level projects to sports development. Football serves a social function, comprises a series of public assets, and has several effects, which are generally good for a nation's socio-economic development. A country's economic performance positively influences its performance in football (Mendoza, 2017).

The current study made a pioneering attempt to report a comprehensive study of the football industry and its role in international trade and the economy. The study observed that football mega-events like World Cup can increase tourism significantly. The impact in international trade occurs at every level of the football industry because football itself is always creating international matches organized and sponsored by international cooperations, organizations, and firms worldwide.

Table 17. An overview of the football industry

Top associations	AFC, CAF, CONCACAF, CONMEBOL, FIFA, OFC, UEFA.
Top domestic leagues	Bundesliga, EPL, LaLiga, Ligue 1, Seria A.
Top International Competitions (among clubs)	Club World Cup, Copa Libertadores, UCL, UEL.
Top clubs	Barcelona FC, FC Bayern Munich, Manchester City, Manchester United FC, Real Madrid CF.
Top International Competitions (among national teams)	Africa Cup of Nations, Asian Cup, Copa America, FIFA World Cup, UEFA Euro.
Top national teams	Argentine, Brazil, England, France, Germany, Italy, Mexico, Portugal, Spain.
Top football kit brands	Adidas, Joma, Kappa, New Balance, Nike, Puma, Umbro.
Top Sponsors (of clubs)	Accor, AIA, Emirate, Ethihad, Rakuten, Teamviewer, Three, T-Mobile.
Top Football manufacturer countries	China, India, Pakistan, Thailand.

Knowing the role of the football industry in the international economy helps to understand the importance of international trade and sports. Football also encourages society to respect each other and stand against racism. It allows fans from different backgrounds to support whichever team or player they like. It also helps them forget their professional, domestic and financial woes while diverting their attention to a sport full of entertainment and excitement. Also, by following and learning from their favorite football players, fans can boost their sportsman spirit in their day-to-day affairs and can strive to live a healthy and active life. Furthermore, football is a great advertising field where some of the biggest international organizations invest in football or sponsor the tournaments. It must be a great opportunity and challenge to be chosen as the official camera brand for filming the World Cup. Isn't it? By making football stars, their brand ambassadors, organizations can sell their products and communicate with the football fans they see as their potential customers and source of revenue. Since not all nations can win football tournaments, nations can strive to benefit from the sports industry in different ways. Countries can benefit from the football industry through manufacturing, selling, and exporting activities.

In this preliminary study, written in a bit informal tone, the general scale of the football industry structure is studied. In the future, more serious and professional attempts can be made to explore the different dimensions highlighted in the current work. The study observed that despite the football associations releasing annual reports, the data from clubs and sponsoring brands is less open. It was also observed that the 2018 World Cup had quite more information than the previous ones. Thus, it is hoped that with time as information becomes more accessible, a better understanding of football's role in business and socio-economic development can be reported.

Appendix – I: Nomenclature

Abbreviation	Full form
AFC	Asian Football Confederation
CAF	Confederation of African Football
CBF	Brazilian Football Confederation
CF	Club de Fútbol
CONCACAF	The Confederation of North, Central America and Caribbean Association Football
CONMEBOL	Confederación Sudamericana de Fútbol
DFL	Deutsche Fußball Liga
ENG	England
EPL	English Premier League
ESP	Espana
EUR	Euro
FAP	Financial Assistance Programme
FC	Football clubs
FIFA	Fédération Internationale de Football Association
GDP	Gross domestic product
GER	Germany
OFC	Oceania Football Confederation
PKR	Pakistani rupee

PSG	Paris Saint-Germain
UCL	UEFA Champions League
UEL	UEFA Europa League
UEFA	Union of European Football Associations
US	United States
USD	United States Dollar

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Does Innovation, Investment and Trade influence Labour Productivity? Empirical Evidence from Selected Countries

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Abstract: Labour productivity is linked to improved living standards of a country, where higher productivity is usually seen as a competitive advantage for the country. The current study aims to identify the influence of investment, trade, and innovation on labour productivity using multi-regression. The sample involved four countries: the United States, Russia, Japan, and China. The results reveal varying degrees of relationships between labour productivity and other variables. In general, investment showed a strong correlation, trade showed a weaker relationship, and innovation showed insignificant relationship. When needed, the policymakers may consider raising labour productivity by improving investment or trade.

Keywords: Labour productivity; foreign direct investment; patents; innovation; trade

1. Introduction

Improving the standard of living in the form of increased consumption is directly related to labor productivity. The growing economy's labour productivity will produce more goods and services by the same relative work. This rise in output affects the possibility to consume more goods and services for a more sensible price. Generally, productivity refers to the economy of a corporation. It is estimated as the rate of output to input (Owyong, 2001). The most common indicator to measure productivity is Labor productivity, which corresponds to feedback acquired from the labour force or determined as the value-added per hour worked (Lieberman & Kang, 2008). Factors of labour productivity are divided into human capital, technological change, and economies of scale that reduce manufacturing costs. Human capital derives from the acquired knowledge such as knowledge and experience, skill, and average experience of workers in economic processes. In comparison, technological change occurs through innovations and inventions that encourage the advancement of new goods and services and increase productivity. Ultimately the other determinant of labour productivity is economies of scale that reduce manufacturing costs (Kagin *et al.*, 2016).

Considering the vagueness in the relationships of labour productivity with other factors, the current study will analyze the relationship of labor productivity to foreign direct investment, patents, and trade-to-GDP ratio among four selected countries (the U.S., Japan, China, and Russia).

After the introduction, the literature is reviewed in which these four variables are reviewed. Later, research methodology is reported, followed by data analysis and results. In the last part, the study concludes with important implications.

2. Literature review

2.1 Labour Productivity

Labour productivity is an important indicator representing the efficiency with which an economy produces goods and services. Van Tam *et al.* (2018) considered labour productivity to be one of the most important factors influencing the competitive capacity of national economies generally and of businesses and organizations particularly. Jorgenson (1988) points out an increase in labour and capital input in the United States occurred from 1947 to 1985. Whereas the rise in capital input is the prominent element of output growth, the increase in labour output is the other root after capital. However, with the perspective that an increase in productivity is insignificant, it should concentrate on mobilizing the sources associated with capital and labour instead of productivity improvements. Baily *et al.* (1996) affirmed the average labour productivity decreases throughout recessions and rose during booms. Heshmati (2013) studied the Least Square Dummies Variables (LSDV) method concerning China between 2000 and 2009, resulting in an essential impact of labour productivity on economic growth, based on the results obtained from the analysis. Alani (2012) noted that the reduction in the economic growth of Uganda from 1972 to 2008 might be triggered by increased productivity. Sequentially, unemployment and the reduction of capital stock were triggered by the rise in productivity. Tabari and Reza (2012) examined the potential influences of technology and education in the sector of agriculture on Iran's labour productivity in 1961-2007 by using the ARDL method. It showed education and technology positively affect labour productivity in the agriculture sector. Thus, technology and education can be concluded as important factors that can affect labour productivity. For a detailed review of labour productivity the works by Patel *et al.* (2017), and Yi and Chan (2014) are recommended.

2.2 Foreign Direct Investment

Studies have acknowledged the positive influence of FDI on the host country's gross domestic product (GDP) growth. Herzer and Nunnenkamp (2011) concluded that FDI has a distinct impact on long-term and short-term income inequality. Ng (2007) examines the relationship between investments and labour productivity within 14 nations in sub-Saharan Africa, considering it directly connected. It is believed that foreign direct investments increased labour's average productivity to implement efficient management and introduce new production technologies. Wacker and Vadlamannati (2011) analysed FDI toward labour market processes optimisation. The outcomes proved a labour standards reduction was a natural outcome of the negotiation process within firms and workers. Camen and Mihaela (2015), according to the data available in 2012 for the European Union countries, the analysis between FDI and productivity per hour highlighted a profound relationship between the quantity of outbound investment and productivity zones. Simultaneously, there is a lack of connection between inbound investment and average labour productivity. It can be noticed that the presence of a relationship between the inbound investment volume and the hourly productivity proved only for those countries with a higher value of gross domestic product per capita (Camen & Mihaela, 2015). For a detailed review of foreign direct investment the works by Al-Qaisi (2017) and, Ricker and Wickramarachi (2020) are recommended.

2.3 Trade to GDP Ratio

As an important measure of openness, international trade has significantly contributed to economic growth. Gross domestic product (GDP) is a popular measure of economic development, and trade plays an important role in most nations' economies. The value of international trade in a country's economics is indicated using the trade-to-GDP ratio. It is determined by dividing the

aggregate value of imports and exports over a period by the GDP for the same period. Keho (2017) reported positive and significant complementarity between trade openness and capital formation in promoting economic growth. The outstanding economic performance of many nations like China's economic growth can be traced back to its increasing engagement in international trade and dynamic trade policy (Sun & Heshmati, 2010). Javed *et al.* (2021) argued that trade (e.g., exports) help achieve a country's comparative advantage in a certain period of its economic development; however, as the country's service sector grows its role begin decreasing. Arguments about international trade raising aggregate productivity at the country level are practically as old as economics. Besides, while international trade may raise aggregate productivity, there is a possibility that aggregate productivity can be raised by international trade. Therefore, empirical work has to distinguish the influence of trade on productivity rather than the other way round. Based on their estimation, the impact of trade on productivity stood at 5 percent, indicating a significant correlation (Frankel & Rose, 2000). Furthermore, Irwin and Tervio (2002) argued that the trade no longer significantly impacts average labour productivity once countries' distance to the equator is included in the empirical analysis. The outcome implies that spatially correlated omitted variables may positively encourage trade on productivity across nations (Frankel & Rose, 2000).

2.4 Innovation

Innovation plays an important role in sustainable development and economic growth, especially in developed and emerging economies. Solow (1957) empirically addresses the role of innovation in economic growth using a Cobb-Douglas production function and believes that the standard inputs of the production function (labor and physical capital), particularly describe a part of economic growth. Minasian (1969) first introduced technological progress by a research and development indicator and introduced it immediately toward production function.

Griffith (2003) stated several existing studies would undervalue the research and development social rate of return by dismissing this absorptive capacity dimension as not influencing the productivity of a country. Empirically, Crépon *et al.* (1998) built a model to explain productivity by innovation output and innovation output by research investments. Their results reveal innovation output surely encourages firm productivity and not innovation input.

According to Peeters and de la Potterie (2005), the influence of labor productivity significantly is the development of innovation, the sufficient standard of work to support innovative efforts, the capability to create new ideas, the determination of the most assuring innovation outlines, and the use of knowledge and external information obtained with either interacting informally with consumers, suppliers, consultant, and competitor, or through collaborate formally with scientific institutions like universities, research institutes, and public labs. Moreover, a similar study shows that the positive effect of those abilities upon labor productivity allows the organization to depart from constant returns to adjust and obtain economies of scale (Peeters and van Pottelsberghe, 2005). For a detailed discussion on the role of patents and innovations in economic growth the works by Maradana *et al.* (2017) and Khan (2015) are recommended.

3. Research methodology

3.1 Data collection

The study involved three independent variables and one dependent variable. The dependent variable was Labour Productivity. The independent variables were Inbound FDI, Outbound FDI, Patents (a proxy for innovation), and Trade-to-GDP Ratio. The data for Labour Productivity was collected from OWID (2021). The data for Inbound FDI, Outbound FDI, Trade to GDP, and Patents were collected from World Bank (2021a), World Bank (2021b), World Bank (2021c), and World Bank (2021d), respectively. Time scale of data was from 2004 to 2017. The sample involved four countries: the United States, Russia, Japan, and China. The data sets are shown in Tables 1, 2 3 and 4.

Table 1. The United States' data from 2004 to 2017.

Year	Labor	FDI inflow	FDI outflow	Trade to GDP	Innovation
2004	56.12	1.75	3.06	24.35	189536
2005	57.30	1.09	0.40	25.56	207867
2006	57.92	2.16	2.05	26.90	221784
2007	58.59	2.40	3.63	27.96	241347
2008	59.20	2.32	2.34	29.89	231588
2009	60.89	1.11	2.16	24.64	224912
2010	62.60	1.76	2.33	28.06	241977
2011	62.72	1.70	2.81	30.79	247750
2012	63.18	1.55	2.33	30.57	268782
2013	63.72	1.72	2.34	30.01	287831
2014	64.19	1.44	2.21	29.96	285096
2015	64.56	2.81	1.66	27.76	288335
2016	64.72	2.53	1.60	26.54	295327
2017	65.51	1.88	2.08	27.18	293904

Table 2. Russia's data from 2004 to 2017.

Year	Labor	FDI inflow	FDI outflow	Trade to GDP	Innovation
2004	12.83	2.61	2.33	56.58	22985
2005	14.7	2.03	2.34	56.71	23644
2006	17.06	3.80	3.03	54.73	27884
2007	19.79	4.30	3.45	51.71	27505
2008	22.58	4.50	3.35	53.38	27712
2009	20.68	2.99	3.54	48.44	25598
2010	23.42	2.83	3.45	50.36	28722
2011	26.71	2.69	3.27	48.04	26495
2012	27.81	2.29	2.21	47.15	28701
2013	28.13	3.02	3.77	46.29	28765
2014	27.46	1.07	2.77	47.80	24072
2015	24.14	0.50	1.62	49.36	29269
2016	23.37	2.55	1.75	46.52	26795
2017	23.91	1.81	2.33	46.88	22777

Table 3. Japan's data from 2004 to 2017.

Year	Labor	FDI inflow	FDI outflow	Trade to GDP	Innovation
2004	37.81	0.16	0.84	23.92	368416
2005	38.69	0.11	1.09	26.52	367960
2006	38.74	-0.05	1.28	30.33	347060
2007	39.35	0.48	1.62	33.09	333498
2008	39.05	0.49	2.26	34.40	330110
2009	38.69	0.23	1.41	24.49	295315
2010	40.08	0.13	1.40	28.61	290081
2011	39.67	-0.01	1.90	30.39	287580
2012	40.03	0.01	1.90	30.64	287013
2013	40.97	0.21	3.02	34.15	271731
2014	41.29	0.41	2.84	37.55	265959
2015	42.42	0.12	3.15	35.64	258839
2016	42.94	0.83	3.63	31.54	260244
2017	43.35	0.39	3.57	34.57	260292

Table 4. China's data from 2004 to 2017.

Year	Labor	FDI inflow	FDI outflow	Trade to GDP	Innovation
2004	4.39	3.48	0.41	59.51	65786
2005	4.84	4.55	0.60	62.21	93485
2006	5.26	4.51	0.87	64.48	122318
2007	5.72	4.40	0.48	62.19	153060
2008	6.12	3.73	1.24	57.61	194579
2009	6.63	2.57	0.86	45.18	229096
2010	7.53	4.00	0.95	50.72	293066
2011	8.26	3.71	0.64	50.74	415829
2012	8.56	2.83	0.76	48.27	535313
2013	9.02	3.04	0.76	46.74	704936
2014	9.55	2.56	1.18	44.91	801135
2015	9.75	2.19	1.58	39.46	968252
2016	10.07	1.56	1.93	36.89	1204981
2017	10.68	1.35	1.12	37.63	1245709

3.2 Multiple regression

Multiple-linear regression analysis is one of the most powerful tools widely used as one of the most abused statistical techniques (Mendenhall & Sincich, 2003). It involves a group of techniques for studying the straight-line associations among two or more variables. The multiple regression model is compelling since it estimates the influences of varying one variable while taking the other explanatory variable constant on the dependent variable without truly having the other variables constant (Smith, 2015). It is "a linear transformation of the *X* variables such that the sum of squared deviations of the observed and predicted *Y* is minimized" (Salkind, 2010: p. 391). Generally, it can be represented as,

$$Y_j = \beta_0 + \beta_1 X_{1j} + \beta_2 X_{2j} + \cdots + \beta_p X_{pj} + \varepsilon_j$$

The *X* denotes the estimate of independent variables, and *Y* denotes the estimate of dependent variables. The observation number is represented by subscript *j*, and the estimate of the unknown regression coefficient denotes as β.

Once the β's have been determined, various criteria are considered to define the authenticity of these measures. The standard authenticity criteria are the correlation coefficient, where the index was ranging from -1 to 1. When the value holds close to zero, this indicates the absence of a significant linear relationship. Meanwhile, as the correlation is near to positive or negative one, the relationship becomes more potent. The value of 1 or -1 demonstrates a perfect linear correlation between two variables.

The multiple regression analysis can manage certain variables by applying dummy variables whose values are 0 or 1, but it depends on whether the particular characteristic is true (Smith, 2015). The minor squares method identifies the coefficient calculations that minimized the number of squared forecast errors as with simple regression. The standard errors can be used for hypothesis tests and confidence intervals; R^2 measures the goodness of fit. If correlations among the explanatory variables affect the standard errors to be disappointingly high, it will cause multicollinearity difficulty. There is no natural cure besides collecting data that are not so highly intercorrelated.

4. Results and discussion

4.1 The United States of America

The United States is the world's largest economy. Data in Table 1 suggests that the labour productivity in the U.S. has been nearly constantly increasing around 1\$/hour per year. On the other hand, the FDI inflow was relatively lower than the FDI outflow, with an average of 1.9 percent in the FDI inflow and an average of the FDI outflow was 2.2 percent. However, the trade

to GDP ratio data showed the trade decreased in 2012 from 30.6 percent to 30 percent and continuously decreased until 2016. In 2017 there was an increase in trade around 0.6 percent from 26.6 percent to 27.2 percent. Ultimately, the patent application by the resident in the U.S. was constantly increasing each year. The results are shown in Tables 5, 6 and 7.

According to the regression analysis of the United States, results have shown that labour productivity negatively affects FDI inflow but has a strong relationship. Meanwhile, trade to GDP was negatively affected by labour productivity, and the correlation is weak. Conversely, FDI outflow correlation is relatively low yet positively affected by labour productivity. However, the correlation between intercept (labour productivity) and innovation is an insignificant relationship.

Thus, the sample of multi-linear regression, in this case, will be,

$$Y = 41.41 - 1.09(X_1) + 0.1(X_2) - 0.03(X_3)$$

where, Y represents labour productivity, X_1 is FDI inflow, X_2 is FDI outflow and X_3 represents trade to GDP ratio.

The goodness-of-fit given by F-statistic is 20.58. Hence the stated model can explain the United states reliably. Besides, the multiple R and R^2 is 0.95 and 0.90, indicating a strong correlation between the dependent and independent variables.

4.2 Russian Federation

Russia is one of the biggest economies in the world. Data in Table 2 suggests from 2004 to 2017, the labour productivity in Russia continuously rose from 2004 to 2014 and started decreasing around 3 $/hours in 2015. Furthermore, in 2015, both FDI inbound and outbound hit the weakest point, which stood at 0.5 percent for FDI inflow and 1.65 percent for FDI outflow. On the other hand, the trade increased around 1.56 in the same year, and the patent application by the residents went to the highest value at 29269 patent applications. The results are shown in Tables 5, 6 and 7.

Ultimately, the multiple-linear regression showed a significant but negative relationship in FDI inflow and trade to GDP. Meanwhile, the FDI outflow shown has a positive yet strong correlation. However, the innovation has shown a positive correlation with an intercept but a fragile relationship.

Hence, the sample of multi-linear regression, in this case, will be,

$$Y = 55.66 - 0.98(X_1) + 1.45(X_2) - 0.97(X_3)$$

where, Y represents labour productivity, X_1 is FDI inflow, X_2 is FDI outflow and X_3 represents trade to GDP ratio.

The goodness-of-fit given by F-statistic is 12.94. Thus, the stated model can explain the Russia Federation reliably. Besides, the multiple R and R^2 stands at 0.92 and 0.85, indicating a strong correlation among the variables.

4.3 Japan

Japan is one of the five biggest economies in the world. Data in Table 3 suggests that Japan's labour productivity was increased constantly, with an average annual change of 0.4 per year. Meanwhile, FDI outflow is higher than the FDI inflow with an average FDI inflow was 0.25, and FDI outflow stood at 2.14 percent. The trade of GDP ratio in Japan was constantly rose until 2014 and started to decrease in 2015, from 37.55 percent to 31.54 percent, then increased to 34.57 in 2017. Eventually, comparing the data of innovation (patent application by resident), the lowest

Table 5. The R statistics

	Multiple R	R Square	Adjusted R Square	Standard Error	Observations
USA	0.95	0.90	0.86	1.18	14
Russia	0.92	0.85	0.79	2.23	14
Japan	0.95	0.90	0.86	0.65	14
China	0.98	0.96	0.94	0.51	14

Table 6. The model fitness statistics

		df	SS	MS	F	Significance F
USA	Regression	4	114.51	28.63	20.58	0
	Residual	9	12.52	1.39		
	Total	13	127.02			
Russia	Regression	4	257.85	64.46	12.94	0
	Residual	9	44.84	4.98		
	Total	13	302.69			
Japan	Regression	4	35.12	8.78	20.87	0
	Residual	9	3.79	0.42		
	Total	13	38.91			
China	Regression	4	55.1	13.77	52.59	0
	Residual	9	2.36	0.26		
	Total	13	57.45			

number of patent applications occurred in 2015 while the highest number of patent applications was in the year 2004. The results are shown in Tables 5, 6 and 7.

Conditioned by the regression output of Japan data indicates a weak and negative relationship in FDI inflow and trade to GDP. Meanwhile, the FDI outflow has a positive yet very strong relationship with labour productivity. Nevertheless, the innovation showed there is no correlation with the intercept.

Hence, the sample of multi-linear regression, in this case, will be,

$$Y = 40.83 - 0.35(X_1) + 1.59(X_2) - 0.04(X_3)$$

where, Y represents labour productivity, X_1 is FDI inflow, X_2 is FDI outflow and X_3 represents trade to GDP ratio.

The goodness-of-fit given by F-statistic is 20.87. Thus, the stated model can explain Japan reliably. Besides, the multiple R and R^2 stand at 0.95 and 0.90, showing a strong relationship between the dependent and independent variables.

4.4 People's Republic of China

China is the second biggest economy in the world. Data in Table 4 suggest that from 2004 to 2017, the labour productivity in China was constantly increased with an average of annual change 0.47 \$/hour. The FDI inflow was relatively higher than FDI outflow with an average FDI inflow of 3.18, and an average FDI outflow is 0.96. Interestingly, China's trade was dynamic, the higher value was in 2006, and the lowest value was in 2017. Meanwhile, the patent application by residents recorded an increase from year to year. The results are shown in Tables 5, 6 and 7.

As the result of the regression analysis of China indicates a very strong and positive relationship between FDI inflow and labour productivity. However, the FDI outflow showed a negative yet strong correlation. The trade to GDP has a weak correlation and is negatively affected by labour productivity. Lastly, the innovation has shown there is a highly weak or no correlation.

Hence, the sample of multi-linear regression, in this case, will be,

$$Y = 11.65 + 1.19(X_1) - 0.58(X_2) - 0.18(X_3)$$

where, Y represents labour productivity, X_1 is FDI inflow, X_2 is FDI outflow and X_3 represents trade to GDP ratio.

The goodness-of-fit given by F-statistic is 52.59. Thus, the stated model can explain China assuredly. Besides, the multiple R and R^2 stands at 0.98 and 0.96 which, showing a strong relationship between the dependent and independent variables.

All in all, this showed the correlation between labor productivity with foreign investment, trade, and innovation. Where the results are reinforced by the value of R and R^2 is greater than 0.8. Furthermore, from the four different counties' analysis outcome, the investment strongly correlates with the dependent variable (labour productivity). On the other hand, most of the trade results

Table 7. The regression analysis

		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
USA	Intercept	41.41	4.31	9.61	0	31.66	51.16
	FDI inflow	-1.09	0.71	-1.54	0.16	-2.69	0.52
	FDI outflow	0.1	0.5	0.2	0.84	-1.02	1.22
	Trade to GDP	-0.03	0.19	-0.17	0.87	-0.46	0.4
	Innovation	0	0	7.42	0	0	0
Russia	Intercept	55.66	14.71	3.78	0	22.39	88.93
	FDI inflow	-0.98	0.86	-1.14	0.28	-2.92	0.96
	FDI outflow	1.45	1.23	1.18	0.27	-1.33	4.23
	Trade to GDP	-0.97	0.2	-4.93	0	-1.42	-0.53
	Innovation	0	0	1.76	0.11	0	0
Japan	Intercept	40.83	3.45	11.83	0	33.03	48.64
	FDI inflow	-0.35	0.98	-0.36	0.73	-2.58	1.88
	FDI outflow	1.59	0.53	3.01	0.01	0.39	2.79
	Trade to GDP	-0.04	0.07	-0.58	0.58	-0.2	0.12
	Innovation	0	0	-1.01	0.34	0	0
China	Intercept	1165	2.18	5.33	0	6.71	16.6
	FDI inflow	1.19	0.4	2.94	0.02	0.27	2.1
	FDI outflow	-0.58	0.5	-1.18	0.27	-1.7	0.53
	Trade to GDP	-0.18	0.05	-3.87	0	-0.29	-0.08
	Innovation	0	0	4.71	0	0	0

have a negative and weak relationship with labor productivity. while for the innovation, shown the same outcome which is there is no correlation with labour productivity.

Some of our results are consistent with the earlier studies. For instance, important empirical literature dating back to Camen and Mihaela (2015) and Ng (2007) shows a strong relationship between investment and hourly productivity. Further, Irwin and Tervio (2002) argued that trade no longer significantly affects the average labour productivity. On the other hand, Peeters and de la Potterie (2005) showed that innovation was influenced by labour productivity, but productivity was not influenced by innovation.

5. Conclusion

The empirical evidence presented in the current study suggests a pattern where investment shows a strong relationship with labour productivity. Whereas in the case of trade, most results indicated a weaker relationship, but it is still possible for stronger relations, as shown in Russia's case. However, the innovation constantly shows insignificant results, which proves that innovation is not affecting labour productivity. It is recommended that efficient management and new production technologies may be deployed to increase the average labour productivity in lowly productive countries.

The capabilities found by this study significantly demonstrate variable impacts to raise labour productivity. In addition, policymakers may use this study to increase labour productivity since labour productivity influences the rise of the country's standard of living. Hence, through this study, policymakers may consider increasing investment. Besides, trade could increase labour productivity, even if its power is not as strong as the investment.

Although this work provides a better understanding of the influence of investment, trade, and innovation on labour productivity, however the findings should not be generalized without further testing as the study involved only four countries. In future, larger sample size and big data should be used to get a comprehensive overview of the problem.

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