

The productivity in the construction industry economics essay



**ASSIGN
BUSTER**

In a perfect world, perfect performance productivity means everybody works 40 hours per week with their holidays and vacations as the exactly plans. There would be no delays and everybody are safe at their workplace. Unfortunately, we are not living in the perfect world and productivity is poorly understood, although construction productivity has been concerned in both construction industry and academia. This assignment is about productivity in the construction industry. Firstly, productivity will be introduced with its definitions and measurements, following by the most important factors which cam improve the productivity in the construction projects, impact project success. Secondly, the economic boom and bust cycle and its impacts on the construction sector will be found out. Finally, New Zealand and the USA will be selected as examples of how the countries are seeking to address the reported decline in productivity.

Productivity

Definition

There is no standardised productivity definition that has been used for the construction sector since standard productivity measure is not easy to define (Constructing Excellence in NZ (CENZ), 2010; Thomas & Mathews, 1986).

Productivity is formally defined by Organization of European Economic Cooperation (OECD, 2001):

Productivity is the quotient (ratio) obtained by dividing output by one of the factors of production. Thus, it is possible to speak productivity of capital, investment or raw materials according to whether output is being considered in relation to capital, investment or raw materials, etc.

Productivity generally indicates the relationship between input and output.

Productivity = input/output or output/input. However, the first formula has been widely used in construction sector.

In other words, productivity is the ratio of output to all or some of the resources used to produce that output.

Output can be homogenous or heterogeneous whereas resources can comprise: labour, energy, capital and raw materials. If output is homogenous, it can be measured in physical units. However if output is heterogeneous, it must be measured in value terms (O'Grady, n. d).

Common measurements in construction

As can be defined above, productivity measure is divided into several forms.

Single factor productivity measures look at the impact of only one factor while total factor productivity measures have all input factors. They are used in different purposes. Both measures have both advantages and disadvantages.

Single productivity measures are for key government policy objectives. They are easy ones and common use (Crawford & Vogl, 2006). Single productivity measures are often divided into measures: labour productivity and capital productivity. However, labour productivity is the most common use since it is related to individual income or living standard. In addition, it can be analysed with reasonable reliability (Treasury, 2008). Capital productivity is measured by dividing total output by a measure reflecting the total amount of physical capital used in the production process (Department of Building and Housing, 2009).

<https://assignbuster.com/the-productivity-in-the-construction-industry-economics-essay/>

The total factor productivity also is called multi-factor productivity measure and labour productivity measures are indicated in the following sub-sectors as the two most commonly used productivity ratios in the construction industry.

Labour productivity

It is the measure of output which is sometimes gross but commonly is gross value by labour input. The labour input can be the number of workers or hours. It has two big advantages (Crawford & Vogl, 2006; Cunningham, 2012):

It is a certain welfare interpretation. Governments have obvious incentives to maximise GDP per capita. Therefore it can be indicated the employment rate times GDP per worker

The measure is very easy to calculate and often feasible estimation because of data limitations.

Nevertheless, its drawbacks are obvious:

As it is the single factor measure so it is suitable for the analysis of total productivity performance.

Its calculations are likely to be econometric so they do not provide sophisticated methods to analyse performance according to its determinations.

Total factor productivity

It is calculated: $Y = Af(C, L, M)$

<https://assignbuster.com/the-productivity-in-the-construction-industry-economics-essay/>

The formula indicates the relationships between output, inputs C, L, Measure (which stand for Capital, Labour and Materials) and a “ shift factor” A.

The key advantage of this measure is easy to aggregate across industries and the data is available from the national account. Conversely it is not a good measure of technology shifts at the industry levels (OECD, 2001).

Factors affecting productivity

There are ten factors which affect construction productivity performance (Horner, 1982):

quality;

number and balance of labour force;

method of construction;

complexity of work;

motivation of labour force;

continuity of work;

required quality of finished work;

type of contract;

degree of mechanisation;

quality and number of managers and weather.

Furthermore, factors impacting construction productivity performance is divided into two factors: internal and external by (Olomolaiye, Jayawardane, & Harris, 1998). The former included: management practice, technology and labour skills and training whereas the later contained: design, weather, changes made by client, level of economic development and political stability.

Successful project throughout the life of the building

Construction projects have existed many challenges such as (William, 2010):

Poor quality of plans and specs;

Weak communication (slow responses between schedule team members) and poor coordination;

Unrealistic schedule demands from customers;

Lack of qualified suppliers and managers.

As those reasons, construction projects can be successful throughout the life of the building if key issues: management, planning and communication are reformed:

Management

Managers play a vital role to manage jobs completed on time and on budget. To improve the productivity, the size of management team should firstly be considered to make sure the team can concurrently arrange and organise multiple jobs. Moreover, the qualified and experienced management team should be concerned in their responsibilities. In addition, meetings should

not be underestimated since problems need to be discussed and identified to show early solutions. They should not be postponed.

Planning

Proper planning always is right to improve productivity and lead the project successful. In general, reduced waste is the key driver. It is not only materials but also wasted labour hours and lost equipment time. Therefore the plan phase should be made at the very beginning the project. Many issues can be avoided by making good plans such as material shortages, weather issues and equipment failures. It should be paid more attention for staff to improve the productivities. Training managers, supervisors and workers is to help them understand deeply their jobs and responsibilities are considered if necessary.

Communication

If planning is well organised but productivity still is low, communication may be is a problem. Making clear goals for each periods of time is crucial so the staff can efficiently do their job. Otherwise, the owner and managers of the company clearly communicate about their company productivity issues. It should be one of the highest priorities.

Economic boom and bust cycle

Definition

Economic boom and bust cycle has been explained in many different definitions. However, almost of them did not arise problems about peaks and troughs of the cycle. An definition mentions the problems is (Investorwords, n. d):

<https://assignbuster.com/the-productivity-in-the-construction-industry-economics-essay/>

A type of cycle experienced by an economy characterized by alternating periods of economic growth and contraction. During booms an economy will see an increase in its production and GDP. During busts an economy will see a fall in production and an increase in unemployment.

In addition many definitions are arisen from the business cycle to apply to the construction industry. Business cycle is also known as economic cycle. Burns and Mitchell (1946) formalised business cycle that:

Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organise their work mainly in business enterprises, a cycle consist of expansions occurring at about the same time in many economic activities, followed by similarly general recession, contractions, and revivals which merge into the expansion phase of the next cycle, this sequence of changes is recurrent but not periodic; in duration business cycles vary from one year to ten or twelve years; they are not divisible into shorter cycles of similar cycles with amplitudes approximating their own.

With similar simple concept, business cycles are defined as fluctuations in economic activity. They virtually show up all measures of economic activity. When times are good, they tend to be good and vice versa. The boom is the period of high financial growth in the economy do GDP is strong because of increase of demand. Therefore, business firms will generate large profits. In contrast, the bust is the period of decreased economic activity with low growth, reduced supply and demand. The fluctuations involve shifts overtime between period of significant growth (the expansion or boom) and period of decline (the recession or bust) (Wikipedia, n. d). The five stage of the

business cycle are growth, peak, recession, trough and recovery (Investopedia, n. d).

Stylised facts of business cycles are defined in terms of the behaviour of the main components of GDP, real wages, productivity, hours, asset returns, and prices and monetary aggregates (Altug, 2010).

Impacts on the construction sector

Boom and bust cycle is considered as the factor impacting productivity in the construction sector (Department of Building and Housing, 2009). Because of the economic boom and bust cycle, many negative influences on the construction industry (Yim, Fan, Fan, Fox, & Ng, 2011). The following will indicate problems in the periods of boom and bust which impact the construction sector.

Many problems, arising in the boom phase, are:

Shortages of many resources such as labour, materials and plant;

Associated increased costs;

Project delays;

Increase in unqualified, untrained, inexperienced, imported labour because people cannot afford the time to attend training ;

Insufficient training capacity;

Loss of efficiency;

Increase in accident rate; stress and other heavy workload problems;

Lower of quality of output (as people rush to complete work);

Lower quality of working life since workers work long hours.

Furthermore, the bust phase also brings many problems:

Unemployment and under-employment;

Loss of trained and experienced people (both temporary and permanent loss);

Loss of income for labour;

Insufficient profit for businesses to be viable (sustainable);

Loss of training (too little income to pay trainees, or for self-employed to take time off seeking for work);

Loss of skills through insufficient use;

Lowering of morale in industry, lowering of motivation;

Lowering of image of industry to newcomers, especially youngsters who see no job security for a career choice in the industry;

Lowering of recruitment to industry.

address the decline in productivity

New Zealand

Introduction

Construction is a big part of the New Zealand economy. It is accounted for 8% of total economy. Approximately 14% of all new employment has been in the sector for recent 10 years. Although it stands for around 10% of all business, the 8% of national employment generates only 40% of national GDP. In comparison with other sector, construction industry has low labour productivity and has been decreased over last 10 years. The sector has small business as its characteristics so it is difficult to invest in people and in capital and to increase its productivity. If labour productivity increase in the construction sector, it will be huge in the economy (PWC, 2011).

Labour productivity comparison between sectors (PWC, 2011, p. 34)

New Zealand tried to stimulate growth and also improve the balance of trade. They have implemented macro-orientated state intervention to stimulate economic growth and labour activity. The country likewise used collective bargaining to facilitate higher productivity at company level. However, productivity growth recently has been so slow. There are many factors affecting to the problem:

The strong employment increase has had their problems because new workforce tends to decrease productivity levels.

Other main barriers to extending services and production are the tight labour which has its own problems and employers complained skill shortages.

<https://assignbuster.com/the-productivity-in-the-construction-industry-economics-essay/>

New Zealand recently has paid more attentions about improvement and the country has three interesting developments focusing on:

The productivity concept has been widely considered. Occupational health and safety, staff turnover and career management are concentrated.

The government, employer or organisation and union are interested in how workplace practises can lead to higher productivity.

Employer behaviour and management practices are more concerned.

The purpose of the New Zealand government in construction productivity (Cunningham, 2012, p. 5)

How to address decline in productivity

In the construction industry, the government plays two roles as direct buyers of construction services and a developer of legislations to improve productivity. The following will present how New Zealand can do to address the decline in productivity (BRANZ, 2011; Constructing Excellence in NZ (CENZ), 2010; PWC, 2011):

Improve planning of capital works programmes

It is crucial that the government provide a good plan for capital work.

Infrastructure investment is required to retain skills in the market downturn.

New Zealand Treasury (2010) mentioned that:

The OECD suggests that investment in infrastructure - particularly in network infrastructure such as transport and communications - seen to

boost long-term economic output more than other kinds of physical investment.

Both central and local government should have a clear picture with both short and long terms focus. They both take responsibilities to address planning problems to mitigate boom and bust cycles.

Build knowledge of sector capacity and invest counter-cyclically

Improving a better understanding of the sector's capacity help Government consider how it times and coordinates capital investment.

Enhance procurement practices

The traditional procurement process is likely to select lowest price rather than lowest whole-of-life costs. They limit opportunities for innovation; creativity and opportunities to affect private sector finance.

Build scale in regional procurement and advocating best practise, creating certainty.

Construction business environment.

In term of ease of doing business, New Zealand performs well in international comparisons. However, construction investment is time consuming and the risks are high due to Resource Management Act (RMA) which has many weakness. Therefore, making changes to improve RMA process will make the investment in construction easier.

Remove the bias toward speculative residential investment

<https://assignbuster.com/the-productivity-in-the-construction-industry-economics-essay/>

Residential building is volatile so it largely impact to construction sector. Moreover, sustainable approach, new legislations and regulations should be implemented to make residential investment an equal among options for investment.

Planning workforce skills for long term. Ensure a steady stream of skilled construction migrants. Skill training should be considered, especially for on-site and multi-projects management.

Increase monetary policy tools and objectives.

Commission more research for impacts of external and internal boom and bust factors.

Promote the important role of construction in New Zealand economic recovery.

The USA

Introduction

Construction is the main industry in the USA. Construction activities impact almost every aspects of the country economy and it plays a vital role in the growth of the whole economy (Chapman & Butry, 2008). It is notice that unlike almost countries, the US government has minimal interventions to improve productivity, particularly in the construction sector. Many progresses have been made such as safety, workforce development, front end planning and constructability (Constructing Excellence in NZ (CENZ), 2010).

fig1

Construction and Non-Farm Labour Productivity Index

There has been many obstacles hinder construction productivity in the US. They have not been changes for a long time (Business Roundtable, 1983; National Research Council, 2009):

Adversarial relationships between owners and contractors, management and labour, union and open-shop workers, business and government;

The lack of accurate information about the industry, its projects, and its labour supply;

Poor safety performance;

Undertrained foremen and poor job-site management;

A lack of training and education for the workforce;

Disinterest in adopting new technologies and a slow pace of innovation;

The lack of management systems;

Collective bargaining agreements and labour practices; and

Government regulations, including building code administration (Change if have time).

The biggest factor has been the decrease of skilled labour due to a shift in the mix output from industrial, commercial and institutional projects to single-family houses (Allen, 1985).

How to address decline in productivity

With many obstacles, the US construction industry is presented five main breakthrough to improve the efficiency and productivity (National Research Council, 2009):

Widespread deployment and use of interoperable technology applications, also called Building Information Modelling (BIM).

Interoperability is the ability to manage and communicate electronic data among owners, clients, contractors, and suppliers, and across a project's design, engineering, operations, project management, construction, financial, and legal units.

Improved job-site efficiency through more effective interfacing of people, processes, materials, equipment, and information.

Time, money, and resources are wasted when projects are poorly managed.

Greater use of prefabrication, preassembly, modularization, and off-site fabrication techniques and processes.

These techniques offer the promise (if used appropriately) of lower project costs, shorter schedules, improved quality, and more efficient use of labour and materials.

Innovative, widespread use of demonstration installations.

They can help to mitigate innovation-related risks to owners, contractors, and subcontractors.

Effective performance measurement to drive efficiency and support innovation.

Performance measures are enablers of innovation and of corrective actions throughout a project's life cycle.

In addition, the US government was recommended by the (Business Roundtable, 1982):

The Bureau of Labour Statistics should extend the areas of construction, i. e. separate industrial construction from non-residential. It will be easier for the government to manage.

The government should develop a long term plan for construction statistics and aggregate productivity indexes improvement.

Furthermore, privately funded and operated national productivity centre will be more concerned about:

Help site managers for site productivity measurement and control programmes

Get and analyse site productivity data and encourage firms to cooperate with the government agencies in providing appropriate construction data.

Can added more?

Conclusion

There is no doubt that productivity is one of the most vital factors impacting the whole performance of any organisation, even small or large. Construction sector often stands lower than other industries in term of productivity. The assignment covered different aspects of productivity from its definition and measures to its impacts on the construction sector. Moreover, boom and bust cycle was mentioned with its impacts on the construction industry. In addition, New Zealand and the USA were introduced with their current economy and construction situation and then many actions were indicated to improve their productivity in the construction sector.