DEFINING THE SCOPE OF THE CONSTRUCTION SECTOR

Andrew Foulkes, Les Ruddock
Salford Centre for Research and Innovation,
The University of Salford, UK
E-mail: A.R.Foulkes@pgr.salford.ac.uk

ABSTRACT: Defining the scope of the construction sector is a key component to the wider view of valuing the sector, and to evaluating the contribution it makes to the economy. Defining and thus measuring the size of the sector is not a simple task; the sector comprises several industries that are involved in different stages of the construction chain. The Pearce Report on 'The Economic and Social Value of Construction' (2003) sets out two opposing definitions, a narrow definition, and a broad one. This paper sets out to assess the definitions, and to ascertain what should be included in the scope used to both value the industry and to examine its importance to the economy.

Keywords - Construction Sector, Defining construction, Valuing construction.

1. INTRODUCTION

Valuing the construction industry, and assessing the importance of the industry to the economy as a whole is a difficult yet important task. Highlighting the importance of construction to the economy is a key point to ensuring it is a high priority for government agendas. This is true not only for the UK but for all countries, and has special significance to newly developed and developing countries, as it can provide a basis for driving the country into development, with a well functioning infrastructure in place that will ensure alternative industries will have the appropriate working environment in which they can grow, as well as creating the right starting point for an energy efficient country which can aim to be sustainable in an environmental context.

There is a distinction between the value to the economy and the value in the economy, both of which will vary vastly dependent upon the definition of the sector used. The value to the economy considers the construction industry's use as a driver for growth, and as a catalyst for other industries to do well. A good construction sector will usually ensure a healthy level of business across the board, as the necessary infrastructure for such actions to occur will be in place. The implicit value in the economy is more easily defined and assessed, and is measured as the contribution to Gross Domestic Product (GDP). However both assessments still rely on a consistent definition of the sector so that reliable and comparable estimates can be made.

Defining the sector itself is not straightforward. The Pearce Report on '*The Economic and Social Value of Construction*' (2003) put forward the narrow and broad definitions of the industry with the narrow definition concerning itself solely to on-site construction activity, and the broader definition also encompassing the quarrying of construction materials, the manufacture of building materials, the sale of the final products and associated professional services such as facilities management.

As the construction sector increasingly diversifies, the need for defining the industry becomes more apparent, with many traditional construction firms looking to broaden the scope of activities they participate in, thus putting more emphasis on the need for a broader definition, with well-defined boundaries. Any definition will need to encompass the entirety of the construction life cycle from the materials extraction stage, through the production of a final product and including the after sales service, all of which creates part of the process of producing and maintaining the built environment.

2. CONSTRUCTION'S CONTRIBUTION IN THE ECONOMY

The construction industry has an important role to play within the overall economy of any given country. How that role manifests itself will vary greatly from one nation to another, in developing countries it is likely that the extraction of raw materials and the on-site construction activity is of most importance, as the country seeks to set up a significant infrastructure, in the form of roads, railways and buildings. In more developed countries, the onus will be on professional services and the sale of the end products. It is also possible that a large DIY and maintenance sector will emerge the longer the main infrastructure has been in place, as potential customers seek to maintain and update current dwellings or work places rather than looking to a new building altogether. This is particularly true in the current climate in the UK where high house prices, rising interest rates, and a high cost of actually moving in terms of stamp duty, legal fees, estate agent fees and removal services means the attraction of improving the current dwelling is much higher than ever before, especially when coupled with falling costs of extensions and conservatories.

Broadly speaking, the construction industry is part of the process creating and sustaining the built environment. In a narrow view, the construction industry is placed solely in the secondary sector, as these accounts for the transformation from manufactured materials into a final product. However the reality is that the construction industry spans across the primary, secondary and tertiary sectors, as the process sees raw materials transformed into manufactured materials and then on into a final product, with professional services and sale of products at the end of the line. The weightings of each part of the chain will vary from one country to another, skewed according to their level of development, with a higher concentration of primary and secondary sector firms in developing countries and much more tertiary sector firms in developed countries such as the UK.

The construction industry contributes greatly to the GDP of the country. Using the narrow view this is about 6% of GDP but using the broad view it is nearer 20% in the UK, using the definitions from the Pearce Report (2003) (with more detailed analysis of certain sectors) as outlined in section 1.4 Defining the Sector, and using data from the UK Input-Output Tables (2005), which is presented in a standardised format, an International Standard Industrial Classification of all economic activities (ISIC) agreed by the United Nations to allow international comparisons. For comparisons just within the member states of the European Community, The General Industrial Classification of Economic Activities within the European Communities (NACE) is also in place.

Another factor that makes the construction sector of utmost importance to the economy is the role it plays in sustainable development by the proper implementation of a sound infrastructure the basis for sustainable development is laid in place. Coupled with ever advancing technologies into new build, and similar technologies applied to maintenance and alteration of existing builds, the construction industry plays a key role in ensuring a country can sustain a given level of development. Sustainability is increasingly becoming high priority to more and more countries. According to *"Sustainable Development and the Future of Construction"* (CIB, 1998), the drive for sustainability identifies economic, social and cultural aspects as part of the sustainable construction framework, but special regard is given to ecological impacts to the environment, with more countries joining environmental pacts, and with fossil fuels and exhaustible materials for building becoming more scarce, the construction industries part in sustainable development is becoming more important. Building projects that incorporate energy saving schemes such as advanced insulation, or natural energy creating technologies such as solar panels, or indeed that use novel materials in the physical build contribute to sustaining the environment and thus aid the overall objective of sustainable development.

3. DIVERSIFICATION IN CONSTRUCTION

As little as 20 years ago, construction firms dealt solely with the build of the actual project in hand. Over the years, however, these firms have begun to diversify both upstream and down stream. Many construction firms now run their own mining branches, to provide themselves and others with the raw materials needed to create the manufactured materials that go into the on-site process. They have also moved towards providing services after the final product has been made, these include the sales of the products themselves and in many cases the security and maintenance of those products. The maintenance can include, window cleaning, repairs, cosmetic upkeep, and there is also the management of these services, which has created a new work branch under the heading of facilities management.

The reason for this diversification is varied. Some firms have moved into other areas as it is cheaper for them to provide the service themselves than to pay for someone else to do it. Other firms have reacted to the volatility of the construction sector. By diversifying they can ensure that their firm will stay afloat. The construction industry has a high rate of firms becoming insolvent due to the high level of competition, especially within a regional context. Diversification means that, if one branch suffers due to the effects of high competition then another branch can become the main priority of the firm. A diversified firm may also be more attractive to potential clients, as a much fuller package can be offered from the initial design stage right through to the maintaining of the final product, with no need for several different firms to be brought in. Usually where diversification within a firm exists the firm can benefit from economies of specialisation, the more the firm branches out, or indeed the more the industry as a whole branches out, the more benefit can be gained. Profits usually attributed to other firms in a stream of varying workforces can lie within the same firm once successful diversification has been achieved.

In recent years however, alternative firms have begun to offer similar services, large firms such as Marks and Spencer now also offer services such as security, realising they could provide the service for themselves rather than pay the construction firm who built their store or warehouse. Realising the potential of such extra branches these companies have now also started to offer the services further afar in order to make themselves more diversified and gain from similar benefits as the construction firms have done.

This new development means the future for construction firms' diversification is unclear. They may continue to open up into alternative avenues, or due to the higher competition they now encounter they may withdraw and return to basic construction services again. The latter is less likely. The construction industry is a highly competitive environment and any advantage that can be gained over rival firms is likely to be taken. Competitiveness can be gained in varying ways. For existing firms, this will often include price wars and an attempt to be of a higher quality, but, when so many firms are involved, an extra edge is often needed. This can be gained in two ways. Primarily it is the diversification route, but some firms will rely on being at the forefront of technological advancements, so they can offer cutting edge designs, styles and materials to their clients. Both of these come under the umbrella of innovation. A firm that is innovative has a strong chance of survival in an extremely competitive environment. Either way the extent of this diversification needs to be considered in any valuation of the sector.

4. CONSTRUCTION SECTOR FRAMEWORK

The construction sector consists of much more than merely on-site production. There is an entire life cycle that begins with the extraction of the raw materials at the mining stage and

ends with the after-sales services. Although some of these areas do not lie within the SIC code of construction (45), it can easily be argued that they are directly attributable to construction. In order to gain an accurate measure of what should be including from such sectors as mining, more detailed analysis must be taken, which requires looking at 4 digits SIC codes, which break each individual code into smaller areas such as mining of limestone, or coal. From this a much more accurate measurement can be made as to the contribution made from construction to the economy.

Firstly though, a life cycle must be drawn up that shows which sectors to be considered when looking at specific SIC codes to include in any measurement. This life cycle can also help in giving a broad overview of the sector and its importance across many different areas of industry.

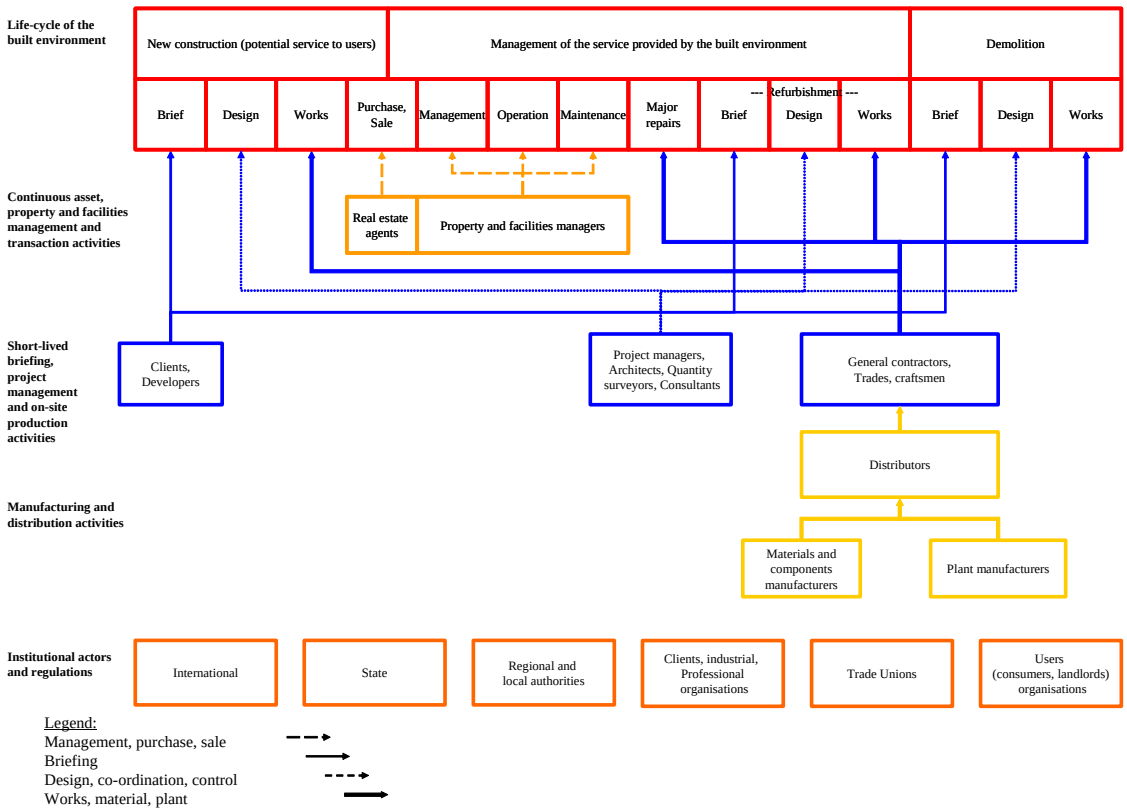

Fig 1. The Construction Sector Framework
(Source: Carassus, 2004)

Fig.1. above shows the full life cycle, including extraction, briefing, design, works and sale, for varying types of projects – new build, services and demolition – and shows how these areas are interlinked with one another.

5. DEFINING THE SECTOR

The Pearce Report (2003) states that the definition will vary according to the focus, but generally speaking there is a 'narrow' and a 'broad' definition as outlined below.

The narrow sector consists solely of on-site assembly including repair work, which encompasses the site preparation, constructions of buildings and infrastructure, building

installation and building completion (decoration). The narrow definition corresponds to the SIC 45 code as used in Input-Output Tables.

The broader definition consists of much more, including the supply chain for construction related products, including the mining of construction materials and the manufacture of construction products. The broad definition also includes professional services such as management, architecture, design and facilities management. These two definitions can be seen in Figure 2 below which depicts the structure of the construction industry, and how the different components feed into the built environment.

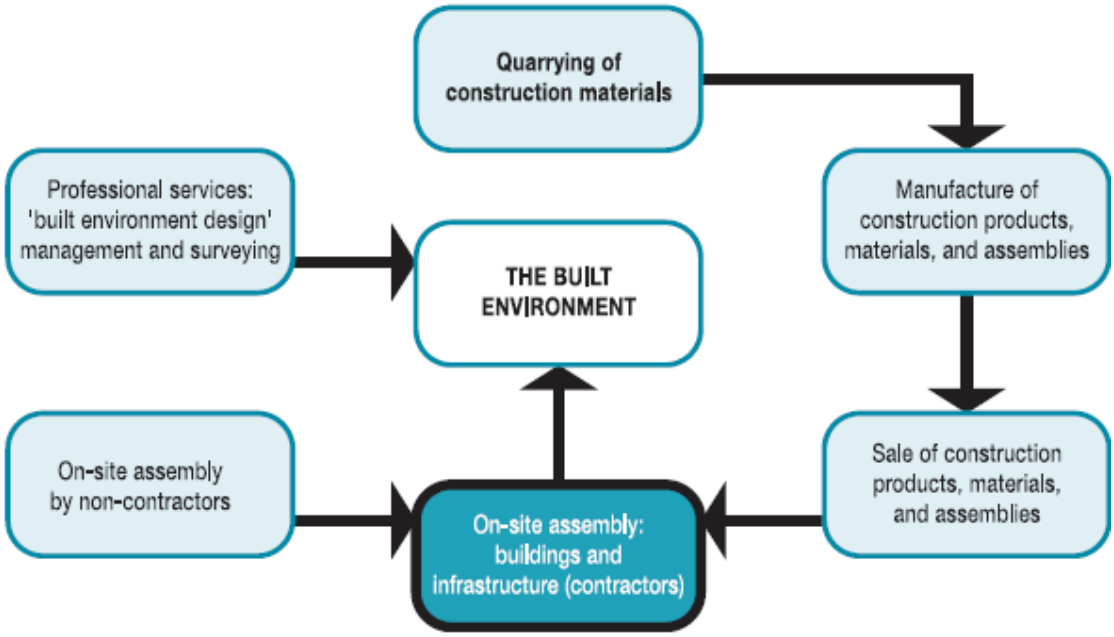

Fig 2. Broad and Narrow Industry Structures
(Source: The Pearce Report, 2003)

Pearce states that 'The wider definition has the virtue of drawing attention to the economic activities that directly depend on the narrower definition of the construction industry. The fortunes of these activities are critically inter-dependent with the fortunes of the contractors' (Pearce Report, 2003). This highlights the ultimate importance of the wider view of construction, as all of the factors which make up the broader view are critical parts of the construction industry's input into the built environment. The separate stages of the construction process, from mining through to sales and management are all dependent upon one another. If on-site construction does not occur, another stage cannot function. Similarly if on-site construction is not needed then neither are the other stages. But it can also work in reverse. If the mining does not occur or indeed if the management following a build does not occur then the on-site construction cannot occur either. This inherent need for each and for every stage to function together gives a strong argument for the broader view to be used as the standard for looking at the construction industry.

The narrow view yields an economic impact of around 5% of GDP, and encompasses approximately 170,000 firms, whereas the broader view is roughly twice this amount contributing 10% of GDP and including 350,000 firms (Pearce, 2003). So there is a significant difference between the narrow and broad definitions and the resulting impact the construction industry has on the economy. However, both of these definitions are quite high level, including 'sectors' of the construction chain rather than individual tasks. In order to truly ascertain the full value of the construction industry and create a better defined

description, a more detailed look at the Input-Output tables and the individual SIC codes is required.

The narrow definition has been established as SIC code 45. Using UK Input-Output tables from 2005, SIC code 45 'Construction Work' gave a Gross Value Added (GVA) as a percentage of total GVA of 6.2%. If we look closely at the full Input-Output tables we can establish which other SIC codes (or part SIC codes) fall within the boundaries of the broader definition. The table below indicates those areas including SIC 45 'Construction Work' in order to give a full view of the composition of the construction industry, and to give a more appropriate valuation for the contribution which the construction industry makes to the economy.

Table 1. Construction Sector GVA contribution by SIC code

SIC Classification	**GVA as a % of total GVA**
14Other Mining and Quarrying	0.08
25.2 Plastic Products	0.12
26.1 Glass and glass products	0.02
26.2/26.3 Ceramic goods	0.03
26.4 Bricks, tiles and construction products in baked clay	0.04
26.5 Cement, lime and plaster	0.01
26.6-8 Articles of concrete, plaster and cement etc	0.21
45 Construction Work	6.2
70.1/part 70.2 Real estate activity with own property	1.89
70.2 (part) Letting of dwellings, including impudent rent	7.9
70.3 Real estate activities on a fee or contract basis	0.5
71.32 Renting of construction and civil engineering machinery and equipment	0.42
74.2 Architectural and engineering activities	1.95
Total % of GVA contributed by 'Construction Sector'	**19.37**

Table 1 includes values calculated from Input-Output tables, and only includes the proportion of each category that is actually directly attributable to the construction industry.

The table above makes it clear that although the broad definition in the Pearce Report is a good one, it still does not give the full picture. By only using high level descriptions of 'sectors' within the construction industry, it is difficult to measure the total impact caused, as in some cases too much value will be attributed to the construction sector, but more critically many aspects are missed altogether. This more detailed break down of how the construction industry contributes to the economy also has the advantage of showing which areas are most important (value added importance rather than actual importance within the chain) to the economy.

It is important to ascertain what proportion of a SIC code is attributable to the construction industry, as in some cases such detailed SIC codes are difficult to obtain. By having a generic percentage for certain areas, calculations can be made to ascertain a figure for other countries where the SIC codes are unavailable. The percentages should remain fairly constant across varying countries regardless of development, as any given overall sector being larger in one country is likely to yield proportionate rises in each of the components of that sector. However this is one factor that will need further analysis, if the calculations were to be used in critical statistical calculations.

Table 2 below therefore shows the individual SIC codes from above and the proportion of the overarching SIC code they belong to.

Table 2. Component SIC code as proportion of High Level SIC code

SIC Classification	High Level SIC Classification	Percentage of High Level SIC code
14 Other Mining and Quarrying	14 Other Mining and Quarrying	100
25.2 Plastic Products	25 Rubber and Plastic Products	11.43
26.1 Glass and glass products	26 Other non-metallic mineral products	6.45
26.2/26.3 Ceramic goods	26 Other non-metallic mineral products	9.68
26.4 Bricks, tiles and construction products in baked clay	26 Other non-metallic mineral products	12.9
26.5 Cement, lime and plaster	26 Other non-metallic mineral products	3.23
26.6-8 Articles of concrete, plaster and cement etc	26 Other non-metallic mineral products	67.74
45 Construction Work	45 Construction Work	100
70.1/part 70.2 Real estate activity with own property	70 Real estate services	18.37
70.2 (part) Letting of dwellings, including impudent rent	70 Real estate services	76.77
70.3 Real estate activities on a fee or contract basis	70 Real estate services	4.86
71.32 Renting of construction and civil engineering machinery and equipment	71 Renting services of machinery and equipment	24.88
74.2 Architectural and engineering activities	74 Other Business services	15.44

These percentages should prove to be useful, when attempting to value different countries' construction industries. For exact measures the specific SIC codes should be used, but when they are unavailable these percentages can be substituted to gain a rough figure based on the high level SIC codes.

A well defined picture of the make-up of the construction industry is important in terms of valuing the industry, but it is also important for making comparisons with other countries. The above list of SIC components can be used to compare not only the overall value of the industry in varying countries but also to see how the make up of those countries differ. It is likely that a well developed country such as the UK will have a high proportion of real estate services, selling off the final product, whereas a developing country is likely to have a higher proportion of the mining and actual 'construction work' stages. Table 3 below highlights the proportion that is attributable to each component of the construction industry's total contribution to the economy.

Table 3. The Construction industry's proportionate contribution to the UK economy by component using SIC codes

SIC Classification	% of total Construction GVA contribution
14 Other Mining and Quarrying	0.41
25.2 Plastic Products	0.62
26.1 Glass and glass products	0.11
26.2/26.3 Ceramic goods	0.15
26.4 Bricks, tiles and construction products in baked clay	0.21
26.5 Cement, lime and plaster	0.05
26.6-8 Articles of concrete, plaster and cement etc	1.08
45 Construction Work	32.01
70.1/part 70.2 Real estate activity with own property	9.76
70.2 (part) Letting of dwellings, including impudent rent	40.78
70.3 Real estate activities on a fee or contract basis	2.58
71.32 Renting of construction and civil engineering machinery and equipment	2.17
74.2 Architectural and engineering activities	10.07

It is clear to see from Table 3, that indeed the main contributors to the economy of the UK construction sector are real estate activity, the construction work itself and architectural activities. These components make up 95.2% of the overall construction contribution to GVA. This knowledge can aid government aims and objectives, and can help a shift in the concentration of regulations, in order to ensure that the stronger sectors of the industry thrive, but are also run legitimately with safety, health, and environmental issues also considered. This knowledge is of utmost importance to developing countries, knowing which areas are of most importance to them, or which areas are likely to be of most importance to them in the long run. This can help the country to plan ahead, and to be prepared for the changes that will occur and to incorporate performance indicators that will take into account the changing nature and the full expanse of the industry.

6. CONCLUSIONS

Defining the scope of the construction sector is a key component of valuing the industry, of measuring the sectors importance to the economy, of understanding construction's role in sustainability and is essential for making provisions for the future.

The make up of the industry itself is more complex than it may first seem. A simple 'narrow' definition does not suffice, as a whole chain of stages is required to feed into the end product - 'The Built Environment'. This chain needs not only considering at a high level, but also at a more detailed level in order to pick out the specific areas that are attributable to the construction sector. Using these specific areas a figure for the amount the construction sector contributes to the economy in terms of GVA can be calculated, which for the UK is almost 20%, a far greater figure than previous estimations of 6% for the narrow definition and 10% for the broader one. However, the construction industry contributes much more than that. It helps improve growth, stability and aids sustainability, through improved infrastructure and by implementing environmental, health and safety regimes.

The proportions of what make up the industry are likely to be different for countries at different stages of development. Countries that are developed, such as the UK, rely heavily upon the design, and retail stages of the construction life cycle, whereas it is likely that developing countries are much more likely to rely upon the earlier stages of the production of a built environment such as mining and the production of the build itself, especially on large scale infrastructure build. These inherent differences must lead to differing government objectives, drives and regulations, in order to gain the maximum benefit from the industry, and to ensure it is carried out in an appropriate manner, whilst planning and building for the future.

The construction industry is a complex one, with many interactive levels, and several 'stages of production' that create an end product, each stage is also made up of various aspects, and some portions of a generic stage (such as mining) may not be attributable to construction. It is when this detailed level of the stages is looked at that it is possible to ascertain the full make-up of the industry, and thus give it a full and comprehensive definition, that can be used to value the industry as a single unit, and highlight the impact the construction sector has on the economy as a whole,

7. FURTHER RESEARCH

In order to gain the maximum benefit from this paper, several areas of follow up to it must be carried out. Firstly it is important that similar work be done on several countries at different stages of development. This will help to show the link between development and the construction industry, and should support the theory that developing countries rely on differing aspects of the chain that makes up the construction industry framework. Comparisons could also be made of the proportions of the SIC codes attributable to the construction industry, to check if they are at least closely consistent across countries regardless of development. This is an important section of work, as all international work, where SIC codes are limited or unavailable would be based on the premise that they do follow a similar pattern.

Further work that could be carried out would be to look at how the industry has changed over several years. This holds two key benefits. Firstly it will give a good indication of where the industry may go in the future - a relative slow changing industry for the past 50 years is less likely to suddenly change than one that has been changing constantly over that time. A second benefit would be to the developing countries that are at a different stage of the construction life cycle, and so can look at how a developed country's construction industry evolved over time, and make provisions for similar changes (taking into account the current economic climates) in their own industry.

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