

### **Construction Management & Economics**



ISSN: 0144-6193 (Print) 1466-433X (Online) Journal homepage: https://www.tandfonline.com/loi/rcme20

# The changing role of builders merchants in the construction supply chain

Andrew Agapiou, Roger Flanagan, George Norman & David Notman

**To cite this article:** Andrew Agapiou , Roger Flanagan , George Norman & David Notman (1998) The changing role of builders merchants in the construction supply chain, Construction Management & Economics, 16:3, 351-361, DOI: 10.1080/014461998372376

To link to this article: <a href="https://doi.org/10.1080/014461998372376">https://doi.org/10.1080/014461998372376</a>

	Published online: 21 Oct 2010.
Ø.	Submit your article to this journal 🗷
<u>lılıl</u>	Article views: 621
a`	View related articles 🗗
4	Citing articles: 7 View citing articles 🗗

## The changing role of builders merchants in the construction supply chain

ANDREW AGAPIOU<sup>1</sup>, ROGER FLANAGAN<sup>1</sup>, GEORGE NORMAN<sup>2</sup> and DAVID NOTMAN<sup>2</sup>

Received 3 June 1996; accepted 14 February 1997

Builders merchants are an integral part of the construction industry, yet rarely are they consulted when discussions take place on the future of the construction industry. Throughout history, builders merchants have played a dominant role in the construction industry, initially as an intermediary between the artisan and the buyer, and more recently as a source of working capital for contracting firms. The merchanting industry currently is undergoing considerable change. The depressed construction market and the failure of the housing repair and maintenance sector to recover in the first half of the 1990's as activity in the private non-housing repair and maintenance sector has increased, has raised competition between merchants. The major building merchants are becoming larger by acquisition and merger, the smaller merchants are seeking niche areas, and the medium-size firms are under serious threat from acquisition by the larger merchanting firms. The trend towards consolidation in the sector, driven by the need to reduce costs, has meant that the large merchanting firms now control around 60% of the building materials market sales. Factoring is a growing trend, particularly with smaller companies sourcing goods from the cheapest source. The larger merchants have to respond by sourcing goods from the lowest cost base, irrespective of whether they buy from overseas markets. This paper analyses the UK builders merchants sector and evaluates the important role played in the supply chain.

Keywords: Building materials, builders' merchants, components, imports

#### Introduction

A number of major studies, including the Technology Foresight report and the Latham report (Latham, 1994) have highlighted the need for the construction industry to be more competitive and to aim to reduce construction costs by 30%. Construction organizations would argue that tender prices already have reduced by 24% in real terms since 1990 and that the profit margin on construction work is 1–2% of the construction price. There are many areas for consideration, e.g.: avoiding over-specification; focusing on the interface between design and construction; using more standard and pre-assembled components; involving suppliers in

the design process; and using more off-site manufacturing and assembly.

Many of the suggestions for savings are influenced strongly by the supply chain; there are opportunities to save on the cost of materials and components in the chain. However, very little consideration has been given to the role of builders' merchants in the supply chain and the role that they can play in helping to reduce construction costs by 30%.

Any firm seeking to acquire materials and components at the best price on the best terms and conditions needs to understand the structure of the supplying industries. Supply terms include price, discounts, reliability and timing of deliveries, and,

<sup>&</sup>lt;sup>1</sup>Department of Construction Management & Engineering, University of Reading, PO Box 219, Whiteknights, Reading, RG6 6AW, UK.

<sup>&</sup>lt;sup>2</sup>Department of Economics, University of Edinburgh, William Robertson Building, 50 George Square, Edinburgh, EH8 9JY, UK

importantly, the credit facilities for payment. Industry, in providing credit facilities to smaller construction companies, provides a lifeline for funding projects. The importance of the merchanting industry in providing the credit facility for many smaller organizations often is overlooked.

The aim of this paper is to investigate the important part played by builders merchants in the supply process and to discuss their changing role in the construction industry. Recommendations are made to consider the contribution the merchanting industry can make towards the industry achieving significant reductions in construction costs.

#### Materials usage

Materials constitute a large proportion of the total cost of construction: the exact proportion varies from project to project, as shown in Table 1. Typically, materials account for 40–45% of the cost of all construction work; this percentage will be much lower in repair and maintenance projects, but appreciably higher for some new large building projects with a high environmental engineering services component.

## Sources of materials and components – the imports problem

The UK has a serious problem in the construction related materials and component supply industries. UK companies are not producing the goods needed by the construction industry, and many are now sourced from overseas. The trade deficit (imports minus exports) in construction related materials and components (CRMC) worsened steadily through the 1980s from a relatively small deficit of £40 million in 1980 to a peak of £2.8 billion in 1989 (Fig. 1). The subsequent improvement in the trade balance through to 1993 can be attributed largely to the impact of the recession in the UK. The trade deficit in UK construction materials

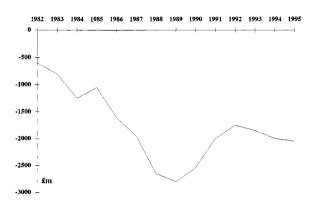


Figure 1 Total overseas trade in construction related materials and components, 1982-95 (Flanagan et al., 1995)

and manufactured components accounts for approximately 15% of the UK's total visible trade deficit. Economic policies, intended to foster domestic growth may be undermined by these deficits.

Since 1990, the UK has lost many manufacturers and suppliers of materials. Many have gone into liquidation, some will start up again, but many have disappeared altogether. Around 105 000 jobs have been lost in these industries since the beginning of the 1980s (Flanagan *et al.*, 1995).

Although it has been assumed that the recent fall in import penetration in construction materials and components has been due to the recession, this has not been proved. Econometric analysis was used to see if there was a statistically significant relationship between the state of the economy and the trade deficit in construction materials and components (Flanagan et al., 1995). This was done by modelling the time series trade deficit data and testing to see if specific changes in the state of the UK economy were reflected in structural breaks in the trade deficit and in the import series. Results indicate that the recent improvement in the trade balance in construction related materials and components has been due to a reduction in imports rather than improvement in industrial performance, and suggests that any upturn in the

 Table 1
 Estimated percentages of value of various project types accounted for by main inputs (Hillebrandt, 1988)

Project type	Operative manpower (%)	Materials (%)	Plant (%)	Other (%)	
New housing	30	43	2	25	
New other building	28	42	4	26	
New civil work	15	35	22	28	
Repair and maintenance	46	30	2	22	
All work	35	37	5	24	

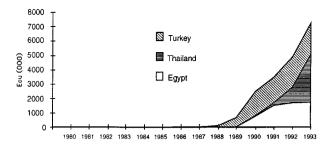


Figure 2 Low value UK imports of ceramic sanitary ware 1980-1993

economy in the mid and late 1990s will be associated with rising import penetration in these industries. Very simply, the structural problems that characterized poor trade performance in the 1980s remain and will continue to affect UK trade performance in these industries.

There are many reasons for the UK's lack of competitiveness: dumping of subsidized products by foreign manufacturers often is put forward as one reason, and also cheap imports from low wage economies. The reasons are complex and different for each sector of the market. Although imports have grown, the slow growth in exports is of equal concern. Figure 2, for example, shows that ceramic sanitary ware from Egypt, Thailand and Turkey has increased in value from zero in 1980 to 7 million ECU in 1993.

Import penetration is high in other sectors because industry is larger in other countries, benefiting from economies of scale and a greater variety of products and designs, such as glazed tiles from Italy. Italy produces around 45% of all tiles in Europe but uses only about 10–15% in their domestic market, exporting the rest.

A study undertaken by Edinburgh University showed that Italy's main export market for tiles is Germany, accounting for 19% of all Italian exports of glazed tiles (Flanagan *et al.*, 1995). The German market is large and prices are high. By using the manufacturing plant efficiently for 24 hours a day, 7 days a week, economies of scale are achieved and unit costs are low. In the UK, 31% of glazed tiles and 60% of unglazed tiles come from Italy.

Clearly there are many diverse reasons for rising import penetration and for poor export performance by some British construction related materials and component sectors. Several features of the materials and components distribution system adversely affect UK manufacturers' competitiveness.

By carrying stock and giving credit, the distribution chain traditionally has sheltered British manufacturers from short term fluctuations in demand and trade debts. Indeed, builders merchants (whose annual turnover is in excess of £6 billion of which some 20% is taken in cash and who give credit) are commonly described as the industry's bankers. This arrangement does mean, however, that British manufacturers have not developed systems that allow them to respond rapidly to changes in demand. Furthermore, some traditionally are isolated from the end user.

The manufacturer therefore tends to be out of touch with customers' needs and is reliant on feedback about market trends which reaches him after having passed through two, three or four levels in the distribution chain. A further factor is the role that builders merchants and Do-It-Yourself (DIY) stores play in the supply process and their influence on the CRMC industries. The merchanting industry currently is experiencing considerable change. The major builders merchants are becoming larger by acquisition and merger; the smaller merchants are seeking niche areas, and the medium-size firms are under serious threat from acquisition. Factoring now is growing, with smaller companies sourcing materials from the cheapest source.

The large merchants have to respond by sourcing goods from the lowest cost base, irrespective of where the goods come from. As an example, in recent years the DIY stores have captured almost half of the ceramic sanitary ware market from the builders merchants.

#### Profile of the merchanting sector

The distribution of a large variety of building materials is complex, and a network of builders merchants has evolved. Builders merchants sales in 1994 were estimated at £6 billion through over 2000 outlets around the UK by the Builders Merchants Federation (Keynote, 1995). This excludes sales from the many DIY outlets.

Traditionally, building products and components sold by merchants are divided into two very broad categories which are referred to as heavy-side and light-side: heavy-side includes basic materials commonly used for the construction of buildings of traditional styles, like sand, gravel, cement, bricks and blocks, timber, roofing tiles and other similar products; and light-side materials include fixtures and fittings and decorating products.

The range of building products and components has grown substantially in recent years. This has led to a growth in the number of outlets selling specific products, e.g. ironmongers, plumbing merchants, etc., and at the same time the development of large stores stocking a diverse range of building materials.

**Table 2** Number of builders' merchants in the UK classified by turnover<sup>a</sup>

Turnover range (£000)	1990	1991	1992	1993	1994
1-49 50-99 100-249 250-499 500-999 1000-4999 5000+	422 449 775 788 845 1158 335	382 417 846 735 830 1086 328	570 368 803 711 775 1074 269	502 402 786 767 818 992 255	418 391 774 744 788 888 219
Total	4772	4624	4570	4522	4222

<sup>a</sup>Firms with a turnover of less than £22 000 and £24 000 are excluded from 1990 and 1991 figures, respectively. *Source*: Business Monitor PA 1003.

## Industry structure

Table 3 lists selected companies based on turnover, profitability and principal activity. There is a small number of very large firms that dominate the merchanting sector, but the total number of merchanting firms has fallen over the last two years. In 1992, there were 4570 builders merchants registered with the Builders Merchants Federation, falling to 4222 in 1994.

Among the large firms in the same period, the fall was from 269 to 219. The 18.6% decline was to a large extent due to consolidation in the industry in the post-boom period. Having become conglomerates with an annual turnover of around £500 million, the larger merchants are now as powerful as many contracting firms.

Consolidation in the merchanting sector has led to an increase in market concentration, i.e. a greater concentration of building material sales in the hands of relatively few suppliers. A concentration ratio can be used to illustrate this trend. Table 4 shows a 30% increase in the concentration ratio between 1990 and 1995. Because larger merchants have more buying power they are in a stronger bargaining position with the materials manufacturers, and also effectively more efficient in their distribution lines.

#### Market trends

The fortunes of the builders merchants are inextricably linked to those of the construction industry, in spite of their mixed customer base. Consequently, they suffer from the same boom and bust business cycles. Construction industry output peaked at £55.3 billion in 1990 and fell to £46.3 billion in 1993 (at constant 1990 prices). Construction industry output increased in 1994 to £49.4 billion.

Table 5 shows the output of construction and the calculated value of the sales of a number of basic building materials, namely sand and gravel, cement, bricks, blocks, roofing tiles, timber, glass and reinforcement steel bars. This is an arbitrary grouping, but it includes all the materials necessary to build a traditional dwelling, or commercial or industrial premises. The sales of the materials mentioned above peaked in 1990, at the same time as the output of the construction industry. After 1990, both went into decline. During 1994, there was a recovery, and sales of materials increased by 6.6 per cent.

According to the index, the prices of 'all materials' increased by 13.4% between 1990 and 1994. As the demand for materials declined with the falling construction orders, manufacturing plants were put out of commission and, generally, for the 3 years to 1993, production and deliveries declined but prices increased. If in the future the demand for those building materials increases, there is little doubt that the prices will continue to increase and there is a likelihood of further importation.

#### Customer base

The construction industry is made up of a large number of units of various sizes and of different skills. The very large construction firms have material producing subsidiaries and, on account of their purchasing power, they are able to deal directly with manufacturers, factors and wholesalers, thus by-passing the builders merchants. The largest customers from the construction industry are to be found among the medium to small firms and independent craftsmen.

#### Role of builders merchants in the supply process

Materials and component manufacturers have three ways of selling their goods: first, direct to the customer; second, through a specialist stockist dealing only with one range of goods; and third, through a builders merchant where the merchant plays only an administrative role. This includes the processing of the contractor's order and arranging payment to the manufacturer. The goods are delivered ex-works to site. A more traditional role is where the merchant buys in and sells from his own inventory of stock.

One of the major functions of a merchant is to act as a channel for credit to the construction industry. Such credit is a vital source of working capital for most contractors. In 1995, merchanting companies had a combined turnover of £6 billion; £1 billion of which was outstanding credit at any given time (Builders Merchants Federation estimate). A two month credit period is not uncommon, except in the case of the

Table 3 Selected merchanting firms by turnover, profitability and principal activity

Merchaning (Zm.) 1994					
C 1150 81 The company's main activities are the distribution of plumbing and bathroom materials, central heating equipment, pipes, valves and fittings in the UK, France, Austria, and the USA. In the UK, the company also distributes heavy-side building materials and operates plant and tool hire centres. Two main retail outlets; Builder Center and Plumb Center.  460.8 15.5 Jewson is a subsidiary of Meyer International PLC. It provides a wide range of building materials, unber and timber products, mainly to small builders, through a network of 195 branches in the UK.  Marketing and distribution of building and plumbing materials to the construction industry. Graham light-side serves the need of customers such as plumbers, heating engineers, utilities and builders, while concentrating on plumbing, beating, sanistary was and kitchen products. Graham heavy-side serves the needs of builders, joiners, local house builders, local authorities and housing associations, with a special focus on timber and heavy building products.  The principal activities of this group are the marketing and distribution of timber, building and plumbing materials to the building trade and industry in general in the UK.  Timber Group. Wickes Retail Group offers DIY enthusiasts and professional tradesmen a range of timber, building materials and home improvement products and services through 95 stores in the UK and 37 stores in Belgium, Holland and France.  Timber and building supplies	Merchanting firm	Turnover (£m) 1994		Principal activity	Recent developments
460.8 15.5 Jewson is a subsidiary of Meyer International PLC. It provides a wide range of building materials, timber and timber products, mainly to small builders, through a network of 195 branches in the UK.  Marketing and distribution of building and plumbing materials to the construction industry. Graham light-side serves the need of customers such as plumbers, heating engineers, ulifities and builders, while concentrating on plumbing, heating, sanitary ware and kitchen products. Graham heavy-side serves the needs of builders, joiners, local house builders, local authorities and housing associations, with a special focus on timber and heavy building products.  The principal activities of this group are the marketing and distribution of timber, building and plumbing materials to the building trade and industry in general in the UK.  The Wickes group supplies timber and building products to retail, wholesale and trade professional customers through its two main businesses: Wickes Retail Group and Hunter Timber Group. Wickes Retail Group offers DIY enthusiasts and professional tradesmen a range of timber, building materials and bome improvement products and services through 95 stores in the UK and 37 stores in Belgium, Holland and France.  Timber and building supplies	Wolsley PLC	1150	81	The company's main activities are the distribution of plumbing and bathroom materials, central heating equipment pipes, valves and fittings in the UK, France, Austria, and the USA. In the UK, the company also distributes heavy-side building materials and operates plant and tool hire centres. Two main retail outlets, Builder Center and Plumb Center.	£\$
am Group 418.8 8.603 Marketing and distribution of building and plumbing materials to the construction industry. Graham light-side serves the need of customers such as plumbers, heating engineers, utilities and builders, while concentrating on plumbing, heating, sanitary ware and kitchen products. Graham heavy-side serves the needs of builders, joiners, local house builders, local authorities and housing associations, with a special focus on timber and heavy building products.  The principal activities of this group are the marketing and distribution of timber, building and plumbing materials to the building trade and industry in general in the UK.  The Wickes group supplies timber and building products to retail, wholesale and trade professional customers through its two main businesses: Wickes Retail Group and Hunter Timber Group. Wickes Retail Group offers DIY enthusiasts and professional tradesmen a range of timber, building materials and home improvement products and services through 95 stores in the UK and 37 stores in Belgium, Holland and France.  Timber and building supplies  Timber and building supplies	Jewson Ltd	460.8	15.5	Jewson is a subsidiary of Meyer International PLC. It provides a wide range of building materials, timber and timber products, mainly to small builders, through a network of 195 branches in the UK.	In November 1994, Jewson reorganized its Sheffield site as a drive through branch. Two further drive through are being planned in Truro and Watford. In the year to March 1995, the company opened a further 67 Hire point outlets, taking the total of this tool hire business to 124.
is Perkins 466.5 38.9 The principal activities of this group are the marketing and distribution of timber, building and plumbing materials to the building trade and industry in general in the UK.  Es PLC 733.6 36.6 The Wickes group supplies timber and building products to retail, wholesale and trade professional customers through its two main businesses: Wickes Retail Group and Hunter Timber Group. Wickes Retail Group offers DIY enthusiasts and professional tradesmen a range of timber, building materials and home improvement products and services through 95 stores in the UK and 37 stores in Belgium, Holland and France.  Timber and building supplies  Suilding  lies Ltd	Graham Group	418.8	8.603	Marketing and distribution of building and plumbing materials to the construction industry. Graham light-side serves the need of customers such as plumbers, heating engineers, utilities and builders, while concentrating on plumbing, heating, sanitary ware and kitchen products. Graham heavy-side serves the needs of builders, joiners, local house builders, local authorities and housing associations, with a special focus on timber and heavy building products.	The group was floated on the Stock Exchange in March 1994. During 1994, the group refurbished 26 of its showrooms at a cost of $£1.4$ bn and was actively engaged in recruitment, training and advertising.
retail, wholesale and trade professional customers through its two main businesses: Wickes Retail Group and Hunter Timber Group. Wickes Retail Group offers DIY enthusiasts and professional tradesmen a range of timber, building materials and home improvement products and services through 95 stores in the UK and 37 stores in Belgium, Holland and France.  Der 446.3 Timber and building supplies	Travis Perkins PLC	466.5	38.9	The principal activities of this group are the marketing and distribution of timber, building and plumbing materials to the building trade and industry in general in the UK.	AAH Builders' Merchants was acquired in April 1994 and Kennedy's Garden Centres were sold in November. In December 1995, Travis Perkins made a £14 m bid for midlands-based Builders' Merchant BMSS to strengthen its position in the North West and Greater Manchester area where it is currently weak.
446.3 Timber and building supplies	Wickes PLC	733.6	36.6	The Wickes group supplies timber and building products to retail, wholesale and trade professional customers through its two main businesses: Wickes Retail Group and Hunter Timber Group. Wickes Retail Group offers DIY enthusiasts and professional tradesmen a range of timber, building materials and home improvement products and services through 95 stores in the UK and 37 stores in Belgium, Holland and France.	In 1994, Wickes opened 16 stores; 15 in the UK and one in France. It has acquired the necessary sites for a further 25 new stores in the UK and on the Continent.
	Harcros Timber and Building Supplies Ltd	446.3		Timber and building supplies	29.2% increase in operating profits between 1993 and 1994.

Table 4	Market concentration of the UK merchanting
sector	

Year	Total industry turnover (£bn)	Combined turnover of three largest merchants (£bn)	Concentration ratio (%)
1990 1995	6.5 7.5	2.6 3.8	40 53

smaller regional merchants who are able to offer only shorter-term credit facilities.

Large merchants are able to offer contractors discounts for large quantities. In some cases, large contractors are able to negotiate prices below the usual discount. Recent press reports suggest that this is a growing trend. Driven by the gradual consolidation in the merchanting sector, housebuilders and contractors increasingly are demanding discounts and negotiating contracts with a single merchant to supply materials on all their sites nation-wide.

Specialist factoring organizations have emerged in recent times. These act as wholesalers to merchants, particularly smaller merchants, and the DIY retailers. Factors are more active in manufactured products where there is a greater variety of products available. This has created the need for buying in bulk. In some cases, merchanting firms have set up factoring organizations themselves.

Merchants are facing increasing competition, both from manufacturers and DIY outlets. The clients of builders merchants are mainly medium-size sole independent tradesmen. Large construction firms have their own material producing subsidiaries. Their

**Table 5** Output of the construction industry in the UK and sales of some basic building materials at current prices (£ bn), 1990–1994

	1990	1991	1992	1993	1994
Construction					
output	55.308	51.115	47.473	46.323	49.350
Sales of					
materials	8.296	7.667	7.121	6.948	7.405
% change					
year-on-year	-	-7.6	-7.1	-2.4	6.6
Materials pric	ce				
index	100	103.9	104.7	108.1	113.4
% change					
year-on-year	-	3.9	0.8	3.2	4.9

Source: Housing and construction industry statistics/ Monthly statistics of building materials and components.

purchasing power also allows them to buy materials direct from, mainly, overseas manufacturers. Increasing amounts of building products are sold direct to the retailer or the consumer. These are normally products for the DIY market.

The role of the UK builders' merchant contrasts with that found on the near continent. The Danish and Swedish systems, for example, stress the need to get merchants involved in the decision-making process at an early stage (Bertelsen, 1995). In particular, representatives of building materials suppliers are involved actively in the design process. This approach has led to substantial productivity gains, particularly on social housing projects. Construction times have been reduced by up to 10%, in some cases, together with a dramatic decline in the number of reported errors. However, this practice can lead to a number of conflicts of interest. For example, when the design team and materials supplier co-operate at the early stages of the design process, a purchasing agreement cannot be written, because contracts require definite terms about what the supplier will deliver. There are no certainties at this stage, only an agreement on the objectives. Suppliers involved in the early stages of design must therefore work on the basis of trust that they will secure the order, or if more than one is involved in the scheme design, that each firm will get its fair share.

#### Competition on price

The customers of UK builders merchants show little concern for quality or fitness for purpose, and this is the principal reason why merchanting firms compete mainly on price. In a recent national survey of construction professionals on the way in which they specified building materials, 14% of the respondents said that they were more likely to choose on price alone, although 8% said they were less likely to do so: building surveyors and local authority architects were found to be more cost-conscious than the other professionals (Mirza, 1995).

It is no surprise that merchants' buyers are preoccupied with negotiating lowest possible price. Value for money or cost in use have been given little consideration. The complex distribution chains and the absence of any legislative requirements for products to comply with standards, or for packaging to contain information on standards, performance, or even country of origin, frequently result in distributors knowing almost nothing about the products they buy or sell. Both the customer and the manufacturer are therefore in a very weak position from the point of view of securing value for money. Standards tend to be driven down with price, and the only barrier appears to be public safety.

## Reducing construction costs – a new role for builders merchants

Several recent studies have identified effective supply chain management as the key to reducing costs in construction (e.g. Atkin *et al.*, 1995). What is more significant, however, is that none of the studies defined what supply chain management is within the construction process, nor proposed how it could be improved.

A supply chain is defined as 'the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer' (Christopher, 1992). Thus, the scope of supply chain management covers the flow of goods from supplier through manufacturing and distribution chains to the end user (Fig. 3). A manufacturer of wooden sheds, for example, is part of a supply chain that extends upwards through the timber stockist to the logging company and downstream through the retailer to the final consumer. Each of the organizations in the chain is dependent upon the others by definition and yet, paradoxically, by tradition they do not co-operate closely with one another.

Manufacturing supply chains have, for example, enabled the industry to become more efficient and establish many long-term relationships, thus ensuring continuity of work and improved quality of the finished product. Demand in construction is less predictable and often sustained over a relatively short period of time; consequently, supply chains in manufacturing are significantly different from those usually adopted for construction. This is compounded by the complex nature of the distribution network for building materials and components.

The construction industry is extremely competitive. Just-in-time (JIT) building materials management, together with good management practices, has the potential to ensure that contractors are competitive in a tough market. In particular, cost savings for a contractor could lead to more competitive pricing for the client. JIT implementation for building materials management requires trust and discipline on the part of the contractor and its suppliers. This requires the contractor to redefine the relationships with its suppliers, e.g. by developing long-term relationships and being prepared to exchange information with them.



Figure 3 The scope of supply chain management (Oliver and Webber, 1982)

The traditional builders merchant is still working on obsolete trading practices, and is open to fierce competition from firms applying more modern concepts of materials merchanting. For the merchants to embrace JIT philosophy, they must reorientate their operations. Hale and Karney (1987) identified the service and delivery factors as the most important JIT ingredients for every supplier to have. However, JIT is a method more suitable for a high-volume repetitive productive environment and there are key aspects of JIT which work best in such a situation: (a) material suppliers will need to make very frequent deliveries of small amounts; and (b) a JIT contractor will want to have absolute confidence in the quality standards of his suppliers. Depending on the distance between the suppliers and the sites concerned, the JIT characteristics in respect of condition (a) might increase the physical distribution costs significantly. Competition on price appears to be a major obstacle to the achievement of condition (b).

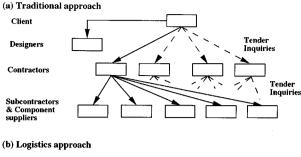
There is no doubt that there are inherent problems with the JIT method. Pheng (1992) has highlighted many of the disadvantages of this approach, and suggested that a major reorganization of the construction industry would be required for the JIT concept to be applied successfully.

However, other material control techniques do exist. One of the most innovative, is the development of logistics models by the Danish Building Research Institute (SBI).

#### The logistics concept

The concept of logistics was developed initially within the manufacturing industry and now constitutes an important management tool to ensure an overall strategic perspective on the flow of materials in the production process (Clausen, 1995). For the construction industry, logistics comprise planning, organization, co-ordination and control of the materials flow from the extraction of raw materials to the incorporation into the finished building. Logistics can be viewed from two viewpoints: from a company point of view where the logistic activities are initiated within the individual company, and from a project perspective where the complete logistic activities for a project are the focus.

In building logistics, the focal points are the interfaces between parties, exchange of data and development across organizational boundaries. Industrial logistics are concerned with developing the entire chain from subcontractors via the factory to distribution of finished products to clients. During the building production process, the management of the flow of building materials to site requires skilful design and



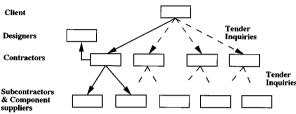


Figure 4 Comparison between traditional and logistics approaches to the procurement process

control of data flows connected with product and production. In a logistics approach the role of data management is crucial, as building design, production and control, prefabrication of components and the site process often are run concurrently. Figure 4 shows a comparison between the traditional and the logistics approaches to the procurement process.

#### Logistics in relation to current practice

The considerable loss and wastage of materials in the construction industry indicates that logistics can be described typically as *ad hoc* collaborations, lack of a long-term strategy and lack of an overall perspective. The design is seldom undertaken with logistic activities of the production process in mind. This is not only because the logistics concept in building is under development, but also is caused by the traditional methods of collaboration and the lack of feedback on problems.

The relationship between suppliers and contractors is characterized by the need to secure the lowest price for materials. The focus is on the lowest price, and little consideration is given to the inevitable costs related to materials handling, i.e. logistics costs. Costs, for example, can be incurred by superfluous stock on site, by lack of consistency in delivery, by post-delivery service and by amendments to orders. Decisions made by contractors on the choice of suppliers often are made on the basis of partial information. This is because data are scarce and the participants lack methods and tools to make appropriate decisions. Systematic and careful planning of deliveries is undertaken for only a few categories of materials. This is because gathering and exchange of information is inadequate.

For most of the materials purchased, the planning of deliveries is undertaken on an *ad hoc* basis rather than systematically. This can lead to two types of problem. First, some materials may be purchased just before they are required, resulting in delays, or interruptions to the working schedule. Second, other materials are procured in large quantities without complying with the production needs on site. This can result in a waste of resources during stocking, handling and transporting.

#### Good logistics practice

There is no single standard solution for good logistics practice that can ensure successful building construction. Further development of building logistics therefore is an on-going process that should be based on a set of principles and working methods to ensure that questions relating to the logistics approach are considered carefully both within the individual firm and within the entire construction process. Good logistics practice may be based on the following principles:

a logistically base design where decisions are made on the basis of the most advantageous solution;

policy to minimize the total building costs which requires a knowledge about the logistical costs of different types of materials, forms of deliveries etc.;

planning of production and deliveries should be based on the JIT concept of materials management together with the greater use of pre-assembled components;

planning and operations of site activities based on a strategy to ensure that materials and components are handled, transported and stocked as little as possible;

active participation of top management in the construction process, particularly in decisions relating to building techniques and production technology; and

introduction of new ways of collaboration based on a holistic viewpoint, long-term development, confidence and dependence between parties.

Evidence from pilot projects undertaken in Denmark have shown that major productivity gains are possible if the building process is planned from a logistics point of view, and by involving suppliers in the management of materials supplies (Bertelsen, 1993, 1994). The speeding up of materials flows and the development of materials handling and transportation require co-operation between construction companies and materials

suppliers. Traditionally, suppliers have been selected on the basis of the lowest price. The result has been a large and continually changing body of suppliers which prevents the establishment of a long-term relationship. The aim of the logistics approach to materials management is to eliminate all unnecessary cost in the supply and delivery chains.

#### Partnering relationships

One of the main recommendations of Sir Michael Latham's Constructing the Team report (Latham, 1994) was the need for a reversal of the adversarial relationships and practices that dominated the industry, together with developing new ways of ensuring that all the participants in construction projects achieve a better understanding of clients' expectations. It is against this background that there is a small but growing interest in new ways of working, and in particular those that go under the label of partnership relationships, alliances or partnering.

Partnership, which involves builders merchants and construction companies developing a long-term relationship and possibly closer working relationship, may be a key element in reducing national construction costs. However, there are also potential obstacles to its development. As well as perceived legal difficulties, such as regulations relating to public procurement and EU competitive regulations, the cultural context of the British construction industry also may be a barrier. The traditional emphasis in procurement has been on competitive tendering to secure the lowest bid from materials suppliers.

Partnering, where non-price factors such as assessed capability are also important criteria for selecting suppliers, represents a fundamental break from tradition for both parties.

Closer working relationships between construction companies and builders merchants exist, but they are not widespread. This situation may change in the coming years. Driven by competition amongst themselves, larger merchants may forge closer links with medium-size contracting firms. In which case, organizational and management issues will dominate the partnership negotiations. Builders merchants, in particular, need to be aware of the factors behind successful partnership relationships and how to overcome obstacles to their development.

#### Effective partnership relationships

Several recent studies have identified key factors behind effective partnership relationships (e.g. Pakora and Hastings, 1995; Lewis, 1995).

#### Partner choice is critical

It is vital that there is compatibility between the organizations. Partnering requires specific organizational norms that are not present in all firms. Similarly in selecting suppliers as partners, the emphasis should be on organizational traits rather than superficial attributes such as best practice. A high degree of internal trust, robust team processes, substantial delegation and empowerment, and a genuine openness towards outsiders are key requirements of a successful partnership relationship.

#### Contractual framework

Conflicts will arise in the best managed partnerships. Successful partnerships anticipate this and agree in advance paths and procedures they will adopt. By anticipating and planning ahead, partners can avoid costly litigation and the diversion of resources in managing the conflict. An important element is starting from a contractual base which encourages joint problem solving, information sharing and risk-taking.

Many of the standard forms of contract used in the construction industry are a by-product of the industry's own adversarial ways of working and not the creation of the legal profession (Pakora and Hastings, 1995). It does seem important for the industry as a whole to develop more radical forms of contract and for clients in particular to specify their insistence on partnerships ways of working. Partnerships are sustained by mutual need, a common objective seen as important enough to dominate any issue, and a willingness to share the benefits of a trusting relationship. It is not always possible to develop contracts that encompass all the partnership activities: there are too many tasks, connections and uncertainties.

The need for mutual trust and collaboration between those involved in a partnership venture is crucial. Pakora and Hastings (1995) suggest that these do not happen by accident. In successful partnership there is respect for partners and a willingness to learn from them, not just a view that they are there to provide skills or expertise not available elsewhere. Personal relationships and shared understanding are an important process usually accomplished through team-start-up workshops.

#### Example of interfirm teams

Inland Steel and Edward Gray, an engineering construction company, abandoned the traditional adversarial roles of owners and general contractors to complete the relining of an Inland blast furnace. At the start of the project, Inland and Gray held a two-day,

off-site partnering workshop, assisted by a facilitator, to engage in team-building activities. Participants also developed a partnering charter and formal dispute resolution procedure. To complement the teamwork, the firms defined their relationship as having equal involvement, agreed to share the risks and benefits, and use open-book negotiations. Thanks to these efforts, the project was completed three days ahead of the thirty-three-day schedule and under budget by 15% (Lewis, 1995).

#### Awareness of capabilities

Often organizations are not aware of the many skills and capabilities that lie within them. Pakora and Hastings (1995) refer to this as the 'knowledge iceberg.' Essentially, partnerships are about exchanging knowledge and information in a mutually advantageous way. Unless this knowledge can be assessed easily, problems arise.

#### Joint scoping

Different interpretations and beliefs about the scope and specification of what is to be done are the root of most conflict and adversarial relationships in any construction project (Pakora and Hastings, 1995), in particular, where one specifies to the other. In partnerships, the client and the key participants define the scope and specification together. This requires a determination to reach a commonly understood view of what is to be done, and how it is to be undertaken.

For example, in a major North Sea consortium, the partners worked through some very tough negotiations and feasibility work as a pre-project process to define both the specification of the work to be done and the target cost. They then agreed that the core objective was to meet the specification at the reduced cost and they provided the common incentive for all parties that the savings would be shared amongst the partners (Pakora and Hastings, 1995).

Partnership relationships between parties in the construction industry may be useful to promote greater efficiency in the handling of materials, but also may encourage a more innovative approach to the production of building materials and components. Team work, however, must be based on collaboration beyond a single project. The traditional tendering procedure may be amended to favour this approach on the basis that bids are accepted from the same team of contractors, consultants and suppliers, such that additional contracts are awarded only if there is a consistent reduction in construction costs from one project to another.

#### Conclusion

Builders merchants are an important link in the supply process. Often they are described as the construction industry's bankers, providing credit facilities to mainly small contracting firms; such credit is a vital source of working capital for most contractors. The trend towards consolidation in the merchanting sector, driven by the need to reduce costs, has meant that the big merchants now account for an increasing share of the market.

Construction companies can benefit from the consolidation taking place in the merchanting sector only if they recognize the importance of long-term relationships and effective supply chain management. The supply chains that exist in today's construction industry have developed along with the industry. It is only by improving these supply chains that the benefits to be derived from the key drivers of change can be realized and industrial competitiveness increased. For example, teamwork and incremental improvement require stability of workforce which is achieved easily through off-site manufacture; materials form the main cost element of most projects and are crucial to any cost reduction exercise; partnering could help improve the supply chains through added stability; integration of design and build processes could be used to increase standardization and, hence, simplify supply chains but it depends heavily on supply lead times.

The role of the builders merchant in the construction process has to be re-defined. During the design phase merchants should be established as the party responsible for the flow of information relating to building materials. The involvement of the materials supplier/wholesaler at an early stage of the decision making process in, for example, Scandinavia has led to significant cost savings and increased productivity. Better co-ordination between all parties in the design process will lead, in turn, closer to an optimum solution.

This is where the merchants role would be crucial. By recommending new and better products to the design team, impractical solutions could be pinpointed at an early stage.

Builders merchants are key players in the construction supply chain. However, it is only by recognizing the importance of long-term relationships and alliances with merchants that construction companies can derive significant benefits in terms of increased efficiency.

Partnering is a key element in any cost reduction exercise (few suppliers able to work to specific targets is the ideal scenario). Once the supply chain has been established, work can start on improvements to decrease lead times and costs and increase reliability and delivery times.

#### References

- Atkin, B. Flanagan, R., Marsh, A. and Agapiou, A. (1995) Improving Value for Money in Construction: Guidance for Chartered Surveyors and their Clients. The Royal Institution of Chartered Surveyors, London.
- Bertelsen, S. (1993) Byggelogistik I materialsestyring I byggeprocessen, Bygge-og Boligstyrelsen.
- Bertelsen, S. (1994) Byggelogistik II materialsestyring I byggeprocessen, Bygge-og Boligstyrelsen.
- Bertelsen, S. (1995) Building logistics: a means for improvement of productivity in the building sector, Nellemann, Nielsen and Rauscenberger A/S, unpublished paper.
- Christopher, M. (1992) Logistics and Supply Chain Management. Pitman, London.
- Clausen, L. (1995) Building Logistics. Report No.256, Danish Building Research Institute.
- Flanagan, R., Norman, G. and Worral, H. (1995) Trade performance of the UK building materials and components industry. *Engineering, Construction and Architectural Management*, **2**(2), 141–63.
- Hale, C.D. and Karney, B. (1987) How to professionally qualify your supplier. Proceedings of the American

- Production and Inventory Control Society Annual International Conference, St. Louis, p.590.
- Hillebrandt, P.M. (1988) Analysis of the British Construction Industry. Macmillan, London.
- Keynote (1995) Builders Merchants: 1995 Market Report, 9th Edn. Keynote, Middlesex.
- Latham, M. (1994) Constructing the team: Final report. HMSO, London.
- Lewis, J.D. (1995) The Connected Corporation. The Free Press.
- Mirza, A. (1995) Making the choice cuts. Building Economist, November, 6-7.
- Oliver, R.K. and Webber, M.D. (1982) *Outlook*. Booz, Allen & Hamilton, Inc.
- Pakora, J. and Hastings, C. (1995) Building Relationships: Team Working and Alliances in the Construction Industry. Construction Papers No.54, The Chartered Institute of Building.
- Pheng, L.S. (1992) The Just-in-time Concept to Improving Manufacturing Productivity: Is It Applicable to the Construction Industry? Construction Paper No.8 The Chartered Institute of Building.