needs and from pro-dealers for the rest; and finally, another builder produced one-third of its roof trusses, and bought one-third from pro-dealers, and one-third from component manufacturers. The procurement channels for floor systems and panelized walls were less numerous, but these products were also less commonly used. Only 12 and nine respondents, respectively, purchased floor systems and panelized walls. For floor systems, two of the respondents purchased them from component manufacturers only; three from framers; and five from pro-dealers. For panelized walls, three of the respondents purchased them from component manufacturers; two from framers; and two from pro-dealers. One builder purchased half of its floor systems and panelized walls from pro-dealers, and the other half from framers, while another procured all of its floor systems and panelized walls from its own plant.

Table 3. Procurement sources for large U.S. homebuilders surveyed (percentages represent proportions procured from each source).

Procurement sources	Sawmiller	Broker	Component manufacturer	Pro-dealer	Framer	Homebuilder's own plant
Dimension lumber and structural panels *(23 respondents, 1 did not answer)*						
2 respondents	100%					
1 respondent	80%	20%				
1 respondent	30%			70%		
15 respondents				100%		
1 respondent				70%	30%	
3 respondents					100%	
Engineered wood products *(20 respondents, 2 did not answer, 2 non-users)*						
1 respondent			100%			
1 respondent			80%	20%		
15 respondents				100%		
1 respondent				70%	30%	
2 respondents					100%	
Roof trusses *(21 respondents, 2 did not answer, 1 non-user)*						
9 respondents			100%			
1 respondent			50%	50%		
4 respondents				100%		
1 respondent				70%	30%	
4 respondents					100%	
1 respondent				20%		80%
1 respondent			33%	33%		33%
Floor systems *(12 respondents, 2 did not answer, 10 non-users)*						
2 respondents			100%			
5 respondents				100%		
1 respondent				50%	50%	
3 respondents					100%	
1 respondent						100%
Panelized walls *(9 respondents, 1 did not answer, 14 non-users)*						
3 respondents			100%			
2 respondents				100%		
1 respondent				50%	50%	
2 respondents					100%	
1 respondent						100%

For most products, pro-dealers were, by far, the preferred supply source for large homebuilders. However, 12 companies (i.e., half of the respondents) indicated that they either might (four respondents) or would (eight respondents) switch to more direct purchases from wood products manufacturers in the future. Direct agreements would likely have to be negotiated with forest products manufacturers, with distributors and pro-dealers continuing to play a logistical role.

Table 4 offers an overview of the 11 distinct channels that homebuilders surveyed use for the

procurement of structural wood products, conveying information on buyers (B), sellers (S), subcontractors (SUB). The 11 different "routes" that structural wood products for use in homes may take can be summarized as follows. Wood products are sold to large homebuilders either by a sawmiller (1), a broker (2), a component manufacturer (3), a pro-dealer (6), or a framer (11). In some instances, a framer is subcontracted by the homebuilder to complete the assembly on site (4), and can also be in charge of buying the products (5) from a component manufacturer or a pro-dealer (7 & 8). Finally, products may be sold by a pro-dealer (9) to a component manufacturing plant owned by the large homebuilder (internal purchase in this case), and the plant delivers the systems directly to the site or subcontracts on-site assembly to a framer (10).

Table 4. Current procurement channels for structural wood products used by large U.S. homebuilders surveyed.

Channels	Sawmiller	Broker	Component manufacturer	Pro-dealer	Framer	Large U.S. homebuilder	
						Own component plant	
1	S						B
2		S					B
3			S				B
4			S		SUB		B
5			S		B + SUB		
6				S			B
7				S	SUB		B
8				S	B + SUB		
9				S		B	
10				S	SUB	B	
11					S		B

B = buyer; S = seller; SUB = subcontractor.

For the most part, current purchasing agreements for lumber and structural panels are short-term, lasting less than one year (16 respondents out of 23 users). Similar arrangements were observed for engineered wood products (16 respondents out of 21 users); roof trusses (16 out of 20 users); panelized walls (six respondents out of eight users); and floor systems (nine respondents out of 12 users). Only one respondent purchased lumber and structural panels on the spot market.

Short-term purchasing agreements were not the only form of arrangements. Six of the large builders surveyed bought lumber and structural panels using other forms of trade agreements. These agreements were either long-term arrangements (over a year) with short-term price adjustments (90 days, for instance) or quarterly contracts. Three of the respondents also reported such purchasing agreements for engineered wood products, with one firm purchasing engineered wood products through a long-term agreement of up to four years (prices guaranteed by the manufacturer). Another respondent bought 50 percent of its supplies on the spot market and 50 percent through short-term to two-year agreements with guaranteed prices. Lastly, two respondents relied on long-term arrangements with short-term price adjustments for their roof trusses, panelized walls, and floor systems.

When questioned about the future of their purchasing agreements, 16 of the 24 respondents clearly conveyed their intentions to develop long-term relationships, pointing to longer-term agreements with suppliers and, in two cases, exclusive arrangements. This observation was further confirmed with site visits.

There was no consensus among the respondents on future prospects for the use of prefabricated components. Three firms thought that their use would spread. However, the majority of responding firms felt that prefabricated components would not become more commonplace within the next five years.

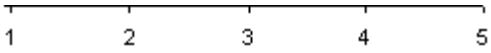
Emerging Issues

Cooperation with Suppliers and Subcontractors

Respondents were asked to rate a variety of business practices with respect to the current level of cooperation that they have with their suppliers and subcontractors on a scale of 1 (in full disagreement with current practice) to 5 (in full agreement). For each practice, mostly relating to different types of information exchange, mean agreement levels were computed and are seen in **Figure 2**. While some level of interfirm cooperation between builders and suppliers/subcontractors is noted, cooperative activities entailing stronger involvement between builders and suppliers (such as developing new products and investing in new ventures) were rarely encountered.

Notably, nine of the respondents added other cooperative practices such as communication on price trends and sales forecasts, as well as cooperation on schedules, to give suppliers a better understanding of demand (some were able to plan six to eight months ahead). Discussions on supply arrangements, means of reducing lead times and costs, and engineering assistance were also listed among cooperative practices.

Figure 2. Current cooperation between large U.S. homebuilders surveyed and their suppliers. The 22 available responses are rated from 1 (in full disagreement with current practice) to 5 (in full agreement).

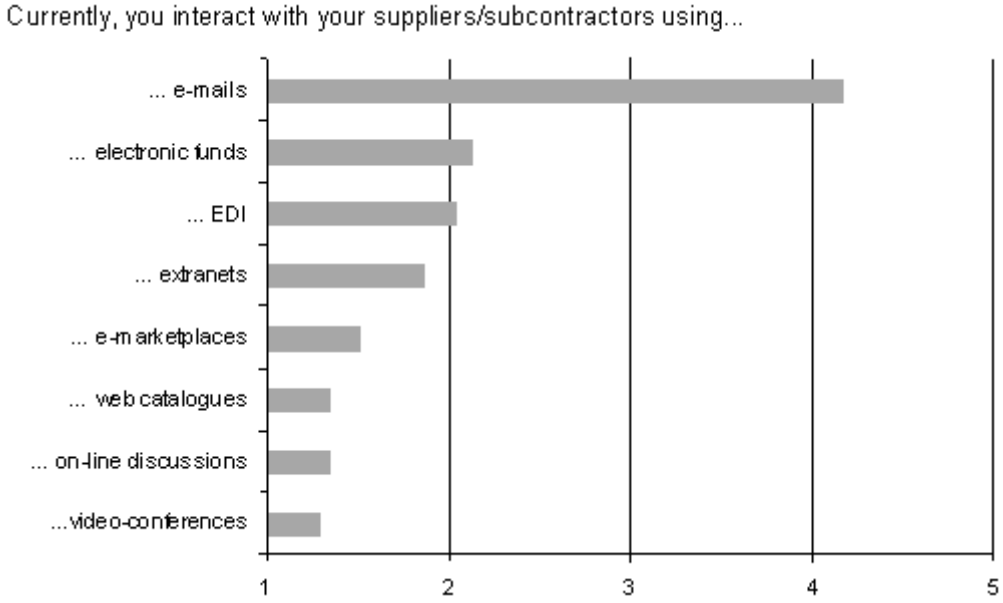


When questioned about the evolution of collaborative practices with their suppliers over the next five years, half of the respondents agreed that they would experience growing cooperation, particularly in the form of increased information and idea sharing, partnering through alliances, and, above all, the emergence of longer-term purchasing agreements. Two of the largest respondents also acknowledged that they would aim for greater control over product specification and purchasing, with subcontractors acting more as service providers. Several other respondents desired shorter supply chains by way of more direct purchasing agreements with manufacturers in order to better monitor activities and reduce costs.

Electronic Business and the Use of Information Technologies

Respondents were asked to rate the main information technology (IT) applications that they used to interact with their suppliers on a scale of 1 (no interaction at all) to 5 (full interaction). Mean interaction levels were computed and plotted in **Figure 3**, which shows that email, not surprisingly, is very commonly used while other types of electronic relationship tools are generally in their infancy. However, the picture is slightly different if only the largest of the builders are considered. Half of the Top 10 U.S. builders stated that they interacted with their suppliers and subcontractors by means of electronic mail, but also reported using Electronic Data Interchange (EDI), electronic funds transfer, and extranet systems. This is in agreement with previous findings on adoption and use of electronic business tools being higher in larger firms (e.g. Vlosky et al. 2002).

Figure 3. IT applications used by large homebuilders surveyed to interact with their suppliers. The 23 available responses are rated from 1 (no interaction at all) to 5 (full interaction).



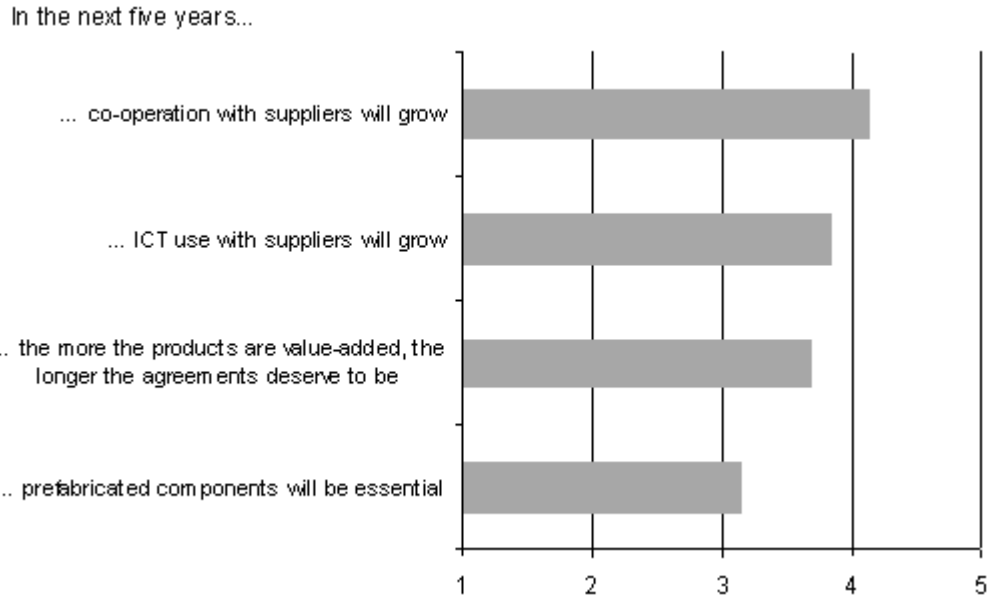
In general, respondents were in agreement that IT applications would gain importance in their relationships with suppliers over the next five years. Only a few respondents were negative or uncertain regarding changes expected with regards to future uses of information technology. Fifteen of 23

respondents indicated a trend toward an increase in the use of IT to interact with their suppliers and subcontractors, especially in light of an increased acceptance of electronic commerce applications such as electronic ordering, funds transfers, and electronic scheduling.

5-Year Forecast on Business Practices and Prefabricated Components

Finally, respondents were asked to indicate their opinions on issues related to the future of business practices. Specifically, they were asked to express their levels of agreement on a scale of 1 (fully disagree) to 5 (fully agree) with the following four statements: 1) Cooperation will grow with suppliers; 2) The use of IT with suppliers will grow; 3) The more the product is value-added, the longer the agreement deserves to be; and 4) Prefabricated components will be essential. Means for each statement were computed and plotted in **Figure 4**.

Figure 4. Large U.S. homebuilders' opinions on trends over the next five years. The 20 respondents were rated on a scale of 1 (fully disagree) to 5 (fully agree).



As **Figure 4** shows, the purchasing representatives of the large homebuilders were strongly expecting increased cooperation with their suppliers (mean of 4.1), as well as increased use of IT to interact with their suppliers (mean of 3.8). Furthermore, the results suggest the existence of a link between types of product and the types of trade agreement. A majority of the respondents thought that value-added products should be covered by longer-term procurement agreements (mean of 3.7).

On their own, the answers to this question from the three respondents among the Top 5 builders suggest that, compared to the rest of respondents, "superbuilders" have different and much more positive perceptions of the future development of information technologies, the expansion of prefabricated components, and the links between the length of trade agreements (i.e., the continuity of the relationship between the buyer and the seller) and the nature of products being exchanged (more or less value-added).

No differences were noted between the “superbuilders” and the other large builders in terms of cooperation with suppliers, both groups showing equal perceptions of its future development. However, the three respondents among the Top 5 builders rated the statement about prefabricated components as being essential in the future (mean of 4.7), whereas the average response (2.9) of the other large builders indicated rather unfocused opinions. The same can be observed for the growth of IT use, with obvious agreement (mean of 4.7) being indicated by the Top 5 respondents, but not the others respondents (mean of 3.7). Finally, the superbuilders generally perceived a positive relationship between value addition and the length of trade agreements (mean of 4.7), while this point seemed less clear to the remainder of the respondents (mean of 3.5).

Discussion and Future Research

On the whole, this study indicates that firms among the Top 100 U.S. homebuilders have developed highly varied strategies regarding home types and size, material uses, and procurement sources. The reasons underlying such diversity in strategies could not be precisely identified in the context of this study, but may represent an area of further investigation. However, it is possible that this diversity is a characteristic of an industry in transition, in which firms are trying to adapt to changes in their business environment without any clear or unique direction.

The first objective of this study was to document current and prospective building techniques used by the largest U.S. homebuilders. Previous research by Fell and Robichaud (2002) showing that large builders were more likely to use structural components than smaller ones is reinforced by the results of this survey in as much as many respondents (20 out of 24) reported using engineered wood products, roof trusses, and, to a lesser extent, panelized walls and floor systems. Taken in this light, prefabrication appears to be an adequate solution for many large homebuilders, in terms of its product attributes (availability, straightness, price volatility, etc.), waste reduction on site, and ease/speed of assembly and installation.

However, an anticipated wider use of modular building systems among large builders was not observed in this analysis, with very few of the respondents actually having adopted modular construction, nor expecting to do so in the next five years. The fact that respondents did not rate prefabricated components highly with respect to future construction is something of a paradox in view of current known use levels. This paradox needs to be addressed and possible explanations are suggested below.

A first concern relates to a possible semantic misunderstanding regarding the term “refabricated components” used in this study to refer to factory-built components, such as trusses for instance. It was also observed that some of the respondents were not familiar with other terms, like “pro-dealer”. Further research should address the issue of the nomenclature employed in the homebuilding sector.

Nevertheless, there may be a belief among large homebuilders that prefabrication will not gain any further traction in displacing traditional stick-built methods. If this is true, their motivations need to be identified, and the existing or perceived barriers to adoption should be further studied. One conjecture is that these barriers are related more to industry structure and current business practices, rather than

problems inherent to the technology or product attributes. Indeed, recent work by Robichaud et al. (2004) suggests that the current (and still evolving) distribution channel structures for wood products make it more difficult for builders to make an easy transition from stick-built techniques. For instance, the presence of intermediaries may prevent some builders from communicating with product manufacturers to address problems when they occur on site or after installation. This may be a major hurdle in view of the fact that, since the end of 2000, homebuilders have had difficulties in finding reasonable insurance coverage, and this has forced them to try and transfer risk to other parties (Robichaud et al. 2004).

The results of this study speak to a restructuring within the industry, coupled with important changes in the way business is conducted between large builders and their suppliers. That said, the homebuilding industry and its upstream suppliers generally seem resistant to change and to the adoption of new business practices. This, combined with a lack of information on and understanding of new building techniques and their impact on business practices, may be considered potential barriers to future developments. Further research can serve to confirm this hypothesis and help the homebuilding sector to overcome some of the cultural hurdles that present themselves as a result of innovation and the development of adapted business practices.

A further issue may relate to a shift in the core business activities of large homebuilders, who have evolved from powerful “hammer holders” into land developers providing turn-key house solutions. As a result, they are likely focusing on issues other than just building techniques and materials purchasing. There may come a point where they want to outsource these activities or form stronger partnerships with suppliers, who would then be charged with choosing the appropriate building methods and developing new products (including engineered wood products and prefabricated components and systems). This evolution in the core business activities of large homebuilders is also hypothesized as a major driver in reshaping the industrial landscape, and it needs to be further studied.

Results from this survey relating to the two other research objectives (understanding the procurement channels and describing relationships with suppliers) provide insights for further exploration. Previous research has indicated that, as a result of consolidation, larger homebuilders have been expanding at the expense of mid-size players, while small builders continued to flourish in niche markets. In addition, pro-dealers have been gaining market share in procuring materials for large homebuilders. This study has confirmed the strong presence of pro-dealers as a main procurement source for large builders, as well as the existence of a small group of “superbuilders”. This latter group is characterized by a largely optimistic vision with respect to enhanced cooperation and IT use with their suppliers.

Observations from this study also align with the literature regarding mergers and acquisitions as a means of pursuing growth and geographical expansion (especially in the case of large homebuilders). Although a few respondents actually operated vertically, many of the firms suggested a preference for acquiring competitors rather than integrating upstream players in the supply chain, such as component manufacturers.

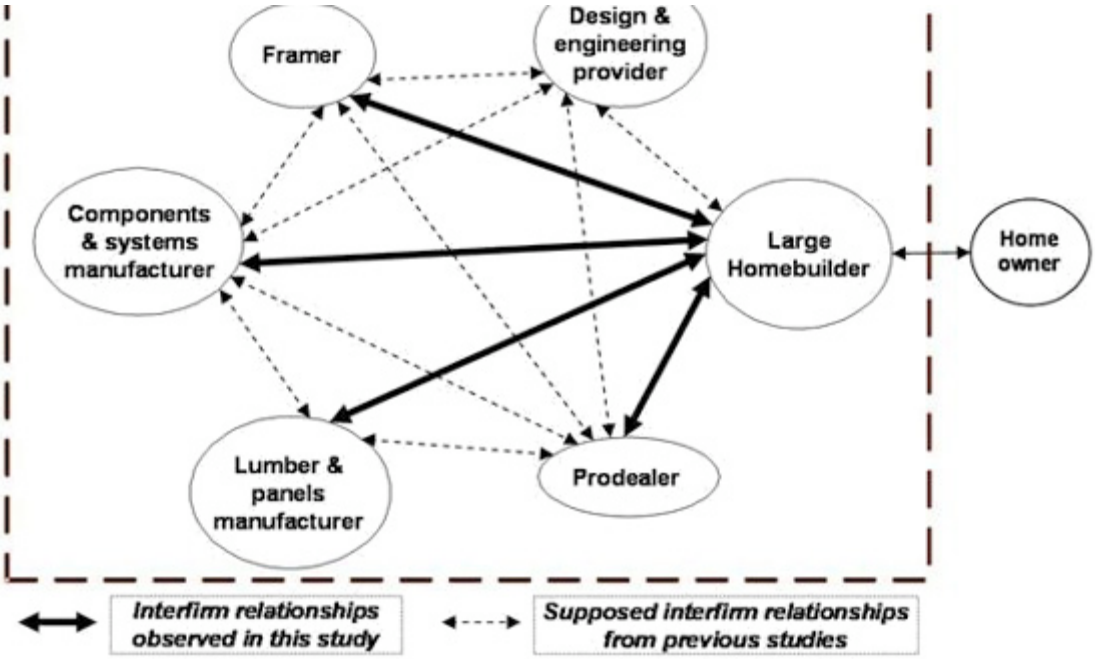
Most respondents foresaw the development of collaborative, more direct, and long-term business

relationships with their suppliers and subcontractors, supported by an increasing use of information technologies. These observations add to previous work (Robichaud and Fell 2002, Robichaud et al. 2004) which showed that the future success of suppliers may rely on going beyond products to offer "complete solutions" (including the addition of insulation, installation, and maintenance services, sharing the cost of warranties, insurance, and litigation, and so on).

The results of this exploratory study also suggest that the evolution of business relationships may be a major driver for the homebuilding sector to continue restructuring and developing more effective collaborative methods, such as value-creating networks. The emergence of these value-creating networks and the evolution of interfirm relationships are in need of further investigation. Although this type of industrial organization is supported in theory and has been observed in other industries, it remains to be proven that value-creating networks can be developed in the wood products and the homebuilding industries. However, the partnerships recently formed in the United States between larger homebuilders and wood products manufacturers can be seen as the first examples of such developments. Little is known about the satisfaction of the parties involved, or the success factors and difficulties encountered in the establishment of such networks in these sectors. Many questions remain unanswered regarding the nature and features of the relationships required, efforts invested in building and maintaining such relationships, and the structure and distribution of power within value-creating networks. For now, it is possible to hypothesize that different value-creating networks may emerge, including for instance: 1) large sawmillers, pro-dealers, and large homebuilders; and 2) component manufacturers, big box stores, and small builders. However, the question of which player within any given network should be focused on to better understand that network remains unanswered.

In an attempt to build on the observations made in this study, and particularly on the assessment of large builders' procurement channels (see **Table 4**), a visual representation of a possible value-creating network for structural wood products is presented in **Figure 5**. The figure shows (in bold lines) the relationships that builders in this study (as buyers) have developed with framers, pro-dealers, component manufacturers, and lumber and panel manufacturers. Other relationships suggested in previous research are shown in hatched lines, an example being the relationship between builders and design and engineering providers (third-party design firms or architects, for instance). It is assumed that framers also have relationships with design providers, component manufacturers, and/or pro-dealers (as buyers) in purchasing products for large builders. Component manufacturers are assumed to maintain relationships with design providers as well, but they also interact with lumber and panel manufacturers and/or pro-dealers (as buyers) on one hand, and with framers (as sellers) on the other hand. In this network of relationships, lumber and panel manufacturers also interact with component manufacturers and/or pro-dealers (as sellers), as well as with builders. Finally, it is suggested that pro-dealers can be involved in business relationships with lumber and panel manufacturers and/or component manufacturers, as well as with design and engineering solutions providers (as buyers) and framers and/or large homebuilders (as sellers).

Figure 5. A possible value-creating network for structural wood products from the perspective of large U.S. homebuilders.



This overly simplistic representation of a value-creating network for structural products reveals many difficulties that further research needs to resolve. The challenges lie in delineating the network, and in accurately representing the flow of different products, the activities implied, the actors involved (integrating their different activities), and their multiple buyer/seller relationships.

Other questions arise, such as the interaction between firms and the coordination of activities in such a configuration. As such, it would also be useful to further investigate the various modes of interaction and coordination, the governance mechanisms in place (trade agreements, contracts, and so on), and the tools (including Internet-based technologies and systems) that allow value-creating networks to emerge and be efficient. Finally, the potential outcomes of this emergent business structure, fostered by close relationships, also should be considered. Many of the benefits have been documented in the literature, including improved innovation, partners' satisfaction, responsiveness, and flexibility. One of the most recent trends observed has been a new emphasis on customization, and more specifically mass-customization, as one of the possible outcomes of value-creating networks. The extent to which this trend represents a potential avenue for builders – and large builders in particular – has yet to be fully considered.

Conclusion

This exploratory study of large U.S. homebuilders' procurement strategies for structural wood products has provided insight into the current and prospective use of building materials and techniques, procurement channels, and business relationships with suppliers. By offering an integrative approach that was missing in the literature to many of the current trends, it has addressed some of the fundamental changes that are likely to drive the homebuilding sector and, consequently, its upstream industries. In an increasingly competitive marketplace, large homebuilders are becoming larger, as well as quicker and more efficient at building homes. That being the case, it becomes a matter of necessity for wood products suppliers to integrate these changes and evolve to meet the needs of this burgeoning sector.

One of the most promising avenues for structural wood products manufacturers to capitalize on these changes is to place interfirm relationships at the core of their strategic thinking. In doing so, they will need to face up to the formidable task of abandoning their age-old commodity production philosophy and becoming committed actors in the value creation process for homebuilders.

Literature Cited

Abraham, D., C. Fuentes, and D.M. Abraham. 2004. Evaluating web-based bidding in construction: Using simulation as an evaluation tool. International Journal of Electronic Business. 2(2): 121-136.

Al-Mudimigh, A.S., M. Zairi, and A.M.M. Ahmed. 2004. Extending the concept of supply chain: The effective management of value chains. International Journal of Production Economics. 87(3): 309-320.

Alexander, B.T. 2000. John T. Dunlop Lecture – The U.S. Homebuilding Industry: A Half-Century of Building the American Dream. Harvard Univ. 45 pp.

Anderson, J.C. and J.A. Narus. 1990. A model of distributor firm and manufacturer firm working partnerships. Journal of Marketing. 54(1): 42-58.

APA. 2002. Market Outlook – Lumber, Structural Panels, and Engineered Wood Products. APA–The Engineered Wood Association. 57 pp.

Barlow, J. and A. Jashapara. 1998. Organisational learning and inter-firm "partnering" in the UK construction industry. The Learning Organization. 5(2): 86-109.

Barthorpe, S., H.-J. Chien, and J.K.C. Shih. 2003. The current state of information and communication technology usage by United Kingdom construction companies. International Journal of Electronic Business. 1(4): 358-383.

Beauregard, R. and L. Bouthillier. 1993. Crisis in the Quebec forest industry – Problems and possible solutions. Forestry Chronicle. 69(4): 406-408.

Bredström, D., J.T. Lundgren, M. Rönnqvist, D. Carlsson, and A. Mason. 2004. Supply chain optimization in the pulp mill industry – IP models, column generation and novel constraint branches. European Journal of Operational Research. 156(1): 2-22.

Bresnen, M. and N. Marshall. 2000. Building partnerships: Case studies of client-contractor collaboration in the UK construction industry. Construction Management and Economics. 18(7): 819.

Brousseau, E. 1993. Contracts Economy – Information Technology and Interfim Coordination (in French: L'économie Des Contrats – Technologies De L'information Et Coordination Interentreprises). Presses Universitaires de France. Paris. 368 pp.

Builderonline. 2004. Builder 100 Listing – Annual Report on the Largest U.S. Homebuilders. Builder magazine. From **www.builderonline.com/content/builder100/builder100-04.asp?sectionID=228**.

Builderonline. 2006. Builder 100: Survival of the Fit. Michele Mariani, Builder Magazine. From **www.builderonline.com/content/builder100/builder-100.asp?sectionID=94**.

Burnes, B. and R. Coram. 1999. Barriers to partnerships in the public sector: The case of the United Kingdom construction industry. Supply Chain Management. 4(1): 43-54.

Carlsson, D. and M. Rönnqvist. 2005. Supply chain management in forestry – Case studies at Sodra Cell AB. European Journal of Operational Research. 163(3): 589-616.

Cheng, E.W.L., H. Li, P.E.D. Love, and Z. Irani. 2001. An E-business model to support supply chain activities in construction. Logistics Information Management. 14(1/2): 68-82.

Childerhouse, P., L. Lewis, M. Naim, and D.R. Towill. 2003. Re-engineering a construction supply chain: A material flow control approach. Supply Chain Management. 8(3-4): 395-406.

Choi, J. and J.S. Russell. 2004. Economic gains around mergers and acquisitions in the construction industry of the United States of America. Canadian Journal of Civil Engineering. 31(3): 513-525.

Cohen, D.H. and R.A. Kozak. 2002. Research and technology: Market-driven innovation in the twenty-first century. Forestry Chronicle. 78(1): 108-111.

Diamond, J., D.E. Chappelle, and J.D. Edwards. 1999. Mergers and acquisitions in the forest products industry. Forest Products Journal. 49(4): 24-36.

Dillman, D.A. 2000. Mail and Internet Surveys: The Tailored Design Method, 2nd Ed. John Wiley & Sons. New York. 447 pp.

Dwyer, F.R., P.H. Schurr, and S. Oh. 1987. Developing buyer-seller relationships. Journal of Marketing. 51(2): 11-27.

Eastin, I.L., S.R. Shook, and S.J. Fleishman. 2001. Material substitution in the U.S. residential construction industry, 1994 versus 1998. Forest Products Journal. 51(9): 30-37.

Fell, D., E.N. Hansen, and J. Punches. 2002. Segmenting single-family home builders on a measure of innovativeness. Forest Products Journal. 52(6): 28-34.

Fleishman, S.J., I.L. Eastin, and S.R. Shook. 2000. Working Paper 73: Material Substitution Trends in Residential Construction, 1995 vs 1998. Cintrafor. 76 pp.

Forintek. 2001. Technology Roadmap: Lumber and Value-Added Wood Products. Industry Canada, Strategis. From **http://strategis.ic.gc.ca/epic/internet/infi-if.nsf/en/fb01315e.html**.

Frayret, J.-M., S. D'Amours and F. D'Amours. 2003. Collaboration Et Outils Collaboratifs Pour La Pme Manufacturière (in French). CEFRIO. 73 pp.

Gibb, A.G.F. and F. Isack. 2003. Re-engineering through pre-assembly: Client expectations and drivers. Building Research and Information. 31(2): 146-160.

Haartveit, E., R.A. Kozak, and T.C. Maness. 2004. Supply chain management mapping for the forest products industry: Three cases from Western Canada. Journal of Forest Products Business Research. 1 (5).

Helander, N. 2004. Value-creating networks: An analysis of the software component business. Dept. of Marketing, Faculty of Economics and Business Administration. Oulu, Univ. of Oulu, Finland: 239.

International Wood Markets Research (IWMR). November 2004. U.S. Wood Consumption Up in 2003 – Wood's Market Share Holds. Wood Markets Monthly.

Jaworski, B. and A. Kohli. 1996. Market orientation: Review, refinement, and roadmap. Journal of Market-Focused Management. 1(2): 119- 135.

Joint Center for Housing Studies (JCHS). 2004. Residential Supply Chain in Transition: Summary of Findings from Survey of Dealers. Harvard Univ. 29 pp.

Juslin, H. and E. Hansen. 2002. Strategic Marketing in the Global Forest Industries. Authors Academic Press. 595 pp.

Kothandaraman, P. and D.T. Wilson. 2001. The future of competition: Value-creating networks. Industrial Marketing Management. 30(4): 381.

Kozak, R.A. and D.H. Cohen. 1997. Distributor-supplier partnering relationships – A case in trust. Journal of Business Research. 39: 33-38.

Kozak, R.A. and T.C. Maness. 2001. Quality assurance for value-added wood producers in British Columbia. Forest Products Journal. 51(6): 47-55.

Lafferty, B.A. and G.T.M. Hult. 2001. A synthesis of contemporary market orientation perspectives. European Journal of Marketing. 35(1/2): 92-102.

Love, P.E.D., Z. Irani, and D.J. Edwards. 2004a. A rework reduction model for construction projects. IEEE

Transactions on Engineering Management. 51(4): 426-440.

Love, P.E.D., Z. Irani, and D.J. Edwards. 2004b. A seamless supply chain management model for construction. Supply Chain Management – An International Journal. 9(1): 43-56.

Lusch, R.F. and G.R. Laczniak. 1987. The evolving marketing concept, competitive intensity and organizational performance. Journal of the Academy of Marketing Sciences. 15 (Fall): 1-11.

Moyaux, T., B. Chaib-draa, and S. D'Amours. 2004. An Agent Simulation Model for the Quebec Forest Supply Chain. Cooperative Information Agents VIII, Proceedings.

Myers, J. and E.W. Richards. 2003. Supporting wood supply chain decisions with simulation for a mill in Northwestern BC. INFOR. 41(3): 213-234.

Narver, J. and S. Slater. 1990. The effect of a market orientation on business profitability. Journal of Marketing. 54(4): 20-35.

National Association of Home Builders Research Center (NAHB Research Center). 2004. Housing: Facts, Figures and Trends. 56 pp.

Palaneeswaran, E., M. Kumaraswamy, M. Rahman, and T. Ng. 2003. Curing congenital construction industry disorders through relationally integrated supply chains. Building and Environment. 38(4): 571-582.

Partnership for Advancing Technology in Housing (PATH). 2000. Industrializing the Residential Construction Site. 87 pp.

Partnership for Advancing Technology in Housing (PATH). 2005. It for Builders. ToolBase Services Portal. From **www.toolbase.org**.

Price WaterHouse Coopers (PWC). 2002. Global Forest and Paper Industry – Survey of 2001 Results. Price WaterHouse Coopers. 42 pp.

Reeves, J.B., D.S. Stepp, L.E.W. Jr., and D.A. Henderson. 2002. The paper industry: Strategic alliances, joint ventures, and electronic commerce. Southern Business Review. 27(2): 9-17.

Rice, A. May 2002. Endangered species? Consolidation tests the survival skills of the large midsize builder. Builder Magazine.

Rice, A. May 2004. Going for broke. Builder Magazine.

Roadcap, C.A., P.M. Smith, and J.H. Michael. 2002. Internet technologies in the homecenter industry. Forest Products Journal. 52(1): 32-37.

Robichaud, F. and D. Fell. 2002. Prefabricated Walls and Roof Trusses in U.S. Residential Markets – Project No. 3220, Canadian Forest Service No. 41. Forintek Canada Corp. 56 pp.

Robichaud, F. and A. Lefaix-Durand. 2004. Assessment of the Market Strategies Used by Large Builders. Project No. 4018, Value to Wood No. FCC 1., Research Report 2003/04, Forintek Canada Corp. 24 pp.

Robichaud, F., A. Schuler, and P. Lavoie. 2004. Extension on Prefabricated Housing and Structural Components. Forintek Canada Corp. 22 pp.

Schoop, M., A. Jertila, and T. List. 2003. Negoisst: A negotiation support system for electronic business-to-business negotiations in e-commerce. Data & Knowledge Engineering. 47: 371-401.

Schuler, A. 2004. Lumber and Panel Market Outlook – Better "Cushion of Spare Capacity". *In:* 2005 Means Softer Pricing and Less Volatility. NAHB Construction Forecast Conference. Washington, DC.

Schuler, A. and C. Adair. 2003. Demographics, the housing market, and demand for building materials. Forest Products Journal. 53(5): 8-17.

Shook, S.R., Y. Zhang, R. Braden, and J. Baldridge. 2002. The use of Ebusiness in the Pacific Northwest secondary forest products industry. Forest Products Journal. 52(1): 59-66.