FUTURE PATHS FORCONSTRUCTION ECONOMICS

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ABSTRACT

The theoretical foundations, or lack of, and the future development of construction economics has been the subject of debate for some time. The purpose of the paper is to explain the basis for these and argue for the importance of what is being called "modern construction economics". To make this argument the paper starts with two propositions. The first proposition is that CE is a still-emerging field, and the second proposition is that there is a clear difference between what has been known as building economics and what is emerging as modern construction economics. From a review of contributions to the construction economics literature and the discussion of these propositions, four recognised paths to the future for CE are evident. Finally, the arguments for an alternative approach conclude the paper.

INTRODUCTION

There has been an ongoing discussion about the future development of construction economics (CE) and the role theory should take in that development. One aspect of that discussion is the lack of agreement on a definition for CE. Broadly, there are three views of CE. The first follows Hillebrandt and her definition of CE as the application of "economics to the study of the construction firm, the construction process and the construction industry (1974, 2000: 3). Raftery (1991) and Cooke (1996) also cite this as their approach. A second view is based on the classic definition of economics as "the study of the allocation of scarce resources" by Robbins (1927: 2). Ofori (1990), Gruneberg (1997) and Myers (2004) use this as their starting point.

The third approach is somewhat more eclectic, but could be described as economics with a focus on building and construction. Runeson (2000) does not define building economics (the title of his book) but explains at length the characteristics of economics as a science and the methodological implications of that. The books by Gruneberg and Ive (2000) also do not neatly fall into one of the two categories above, and offer an alternative approach. Many of the other books on the economics of construction (eg. Briscoe 1988, Ball 1988, Finkel 1997) or the economics of the built environment (Warren 1993) do not define CE at all. Although this is a small sample of the field it is representative, and shows why Ofori (1994) could confidently claim that no definition has been accepted for CE.

Rather than attempting a definitive answer to the "What is CE?' question, this paper is a contribution to the debate on the future development of CE. The idea for the paper started from two propositions, and the purpose of the paper is to explain the basis for these and argue for the importance of what is being called "modern construction economics". The first proposition is that CE is a still-emerging field. A short review of four papers that have contributed to that debate and a discussion of their conclusions is in the next section. The

second proposition is that there is a clear difference between what has been known as building economics and what is emerging as modern construction economics. To elaborate that proposition there is another short review of some recent books in the field in section three. From this discussion four possible paths to the future for CE are evident. Finally, the arguments for an alternative approach conclude the paper.

An aspect of this debate is the gap between the practice of CE, by quantity surveyors, cost consultants and consulting economists who do life-cycle costing, investment appraisal and cost-benefit analyses, and CE research done mainly by academics. It would be fair to say that the debate over future development of CE and its theoretical foundations is not a major concern for practicioners. But is it really a concern for CE academics? If it is, what is being done about it, and if not why not?

CONTRIBUTIONS TO THE DEBATE

First, the proposition that CE is a still-emerging field. This idea can be traced back to the book by Bon (1989) and was taken up by Ofori (1994). Also, comments by Bon (2001) and Myers (2003) put forward the view (in different ways) that CE has not established itself as a distinct discipline. Finally, a paper by Brochner (2002) is reviewed.

The idea that building economics has yet to establish itself as a discipline begins with Bon's 1989 book *Building as an Economic Process: An introduction to building economics.* In the Preface of that book he stated: "my main purpose is to provide the foundations of a theoretical framework that will inform further development of building economics", and this will be "a first step toward a consistent framework for an explanation of economising behaviour in the building arena" (xiii). The five chapters in the book covered building economics, capital theory, the building process, business and building cycles and suggestions on future research. Further, the "objective of this book is to assemble in one place those concepts that may contribute to the development of building economics as a distinct discipline" (Bon 1989: 25).

In Bon's note on 'The future of building economics' the argument from the 1989 book was restated, the future being "in fields like corporate real estate and facilities management" (Bon 2001: 256). While the future has turned out to be rather more complex than that statement implies, the significance of topics connected to facilities management such as building use and reuse decisions has increased greatly over the last decade, and this has been accompanied by a growth in importance of building life-cycles. As Bon put it "buildings will be designed and constructed with the entire building process, that is, the whole building life, in mind" (2001: 256), again reprising his ideas from 1989. This view was echoed by Myers (2003) in his conclusion that the 'sustainability agenda' was central to the future of building economics.

The next contribution was from Ofori (1994) and his view that construction economics has not yet developed to the point where it could be recognised as a distinct part of general economics. The main reason for this was the lack of consensus on the "main concerns and contents" and more importantly it lacked a "coherent theory" (1994: 304). Interestingly, there were no challenges to either the comments or conclusions in Ofori's paper from construction economists. As an aside, in that paper Ofori also argued for the term

'construction economics' as preferable to 'building economics' because of its wider scope (1994: 296).

Brochner (2002) takes a different view to the ones above. His paper (a Keynote at a CIB W55 Symposium) was about linking building economics to facilities management (FM), but the comments about applying economic theory are very appropriate. He starts by observing that "progress in the field of building economics has been tied to increasing sophistication in analyzing and predicting cost and time of projects or in the analysis of macro data for the construction sector in various economies", but then asks where building economics should be heading. He answers "certain types of economic theory are useful for not only providing ideas for restructuring commercial relationships in the sector, but also for predicting the relative sustainability of new patterns" (2002: 1).

The issue Brochner addresses is whether building economics has a role to play in reforming the industry. He suggests that proposals to change the way the industry works have come from sociology and psychology and "building economists appear to have been timid" in their application of economic theory:

> is the application of economic theory a small niche with diminishing relevance to a larger community of researchers and industry practitioners? On the other hand, how far can construction management research proceed if it is based exclusively on case studies, interviews and e-mail questionnaires, with few strong attempts at theory building, somewhat lax in assumptions that are clearly spelled out and where the reasoning is weak on testable predictions? It can be argued that we need more economic analysis if we wish to create a better industry in the sense of finding commercial patterns that brings the activities of firms closer to customer preferences, managing scarce resources in consonance with sustainable growth (Brochner 2002: 2).

Brochner then identifies two forces transforming the construction industry, firstly the development of information and telecommunications technologies, and secondly deregulation. Partly in response to these forces economic theory has developed new approaches to information, institutions and incentives, particularly network economics. From this base four topics for building economics are discussed: access to and use of quantitative data; signalling in real estate markets; incentives for growth; and, education and competence. Through the discussion there is an emphasis on the importance of incentives for innovation, and the need for a better understanding of these incentives for both firms and individuals in the industry.

Brochner concludes "There is reason to believe that a closer engagement with economic theories of industrial organization will provide both public and private policymakers with a better understanding of incentives for efficient use of scarce resources in the construction and management of facilities" (2002: 7).

The fourth contribution was from Myers (2003), in a paper that follows on from Ofori (1994) and Bon (2001). In his analysis of the syllabus content of quantity surveying, construction management and civil engineering courses at 10 UK universities he followed Ofori's division of the discipline into two types of construction economics: construction industry economics, concerned with the application of economic theory; and construction project economics, concerned with cost planing and control, life cycle costing and

investment analysis. Myers found that this distinction was reflected in the courses being offered, with the emphasis typically on one or the other of these, and thus "construction economics continues to lack any coherent conceptual structure" (2003: 103).

Myers then goes on to argue for a rethinking of CE, purposely echoing the language of the Egan Report (1998). The courses he surveyed do not "concern themselves with the messages generated by Government reports – in particular those, implicitly or explicitly, recommending a sustainable outcome" (2003: 104). The future of CE in Myer's opinion will be based on sustainability, and this will provide both a common purpose and conceptual approach, thus solving the two major problems identified by Bon and Ofori in their papers.

RECENT WORKS

There are many building economics and/or construction economics texts. These include Briscoe (1988), Ofori (1990), Raftery (1991), Warren (1993), Shutt (1995), Cooke (1996), Gruneberg (1997), Runeson (2000), Hillbrandt (2000), Ball (2004) and Myers (2004). In every case there is an introduction to some basics of modern microeconomics followed by the development of a demand-supply model, and usually a chapter or two on the macroeconomic environment for building and construction. How much room is given to each of these topics varies, but they all have in common the intent of providing undergraduate students with a solid grounding in economic theory and its application to the building and construction industry. That said, some of these books are more project based (eg. Briscoe, Shutt, Hillebrandt) and others more industry based (eg. Warren, Gruneberg, Runeson).

There are a further two books on the economics of the construction industry by Ive and Gruneberg (2000) and Gruneberg and Ive (2000), both rather more advanced than those cited above and in parts dealing with acute theoretical issues. For example, some of the analysis is based on the ideas on value and distribution of Sraffa (1960), and is carried out with particular attention to the relationship between value and labour in the construction industry. These books do put an alternative view of building economics forward, and in places argue strongly for a re-evaluation of some of the ideas found in traditional building economics (for example, their view of the industry as three separate markets with little substitution or crossover found on both the demand and supply sides).

The other content of these books shows considerable variation, based on the individual author's emphasis on certain aspects of the building and construction industry. For example, Myers includes transaction costs, Ofori includes management issues and Runeson has a chapter on the labour market. Table 1 attempts to summarise the chapters and topics found in these books in order to allow a rough comparison.

Table 1 is neither comprehensive nor completely accurate. It is not comprehensive because there are many topics covered by one or two authors that have not been included (eg. takeovers in Ball 1988, elasticities in Cooke 1996, bidding theory in Runeson 2000, sustainability in Myers 2004), and it is not completely accurate because it is a broad classification that does not take into account the many differences between authors in their individual approach to a topic or indeed differences in their definition or delineation of specific topics. However, it is a useful

a guide to what these books cover and the similarities and differences between them in their contents. While basic micro and macroeconomics are typically covered, authors clearly make choices about the range of topics that they include.

Table 1. Topics found in CE and economics of construction books

Topics	Authors
Macroeconomic topics	
Aggregate demand and supply	Ball, Bon, Briscoe, Cooke, Gruneberg, Myers, Ofori, Raftery, Shutt, Runeson, Warren
Business and building cycles	Ball, Bon, Briscoe, Cooke, Finkel, Hillebrandt, I&G, Ofori, Raftery, Runeson
Construction and investment	Bon, Finkel, Gruneberg, I&G,
Growth and development	Cooke, Myers, Ofori
Productivity	Briscoe, Finkel, I&G
Microeconomic topics	
Inputs and costs	Cooke, Gruneberg, Hillebrandt, Myers, Ofori, Raftery, Warren
Revenues and profits	Hillebrandt, Raftery, Warren
Labour market and wages	Finkel, Gruneberg, Hillebrandt, I&G, Runeson
Contracting system	Gruneberg, Hillebrandt, I&G, Ofori
Cost benefit analysis/appraisal	Briscoe, Cooke, Gruneberg, Shutt
Industry economics topics	
Market structure	Ball, Briscoe, Cooke, G&I, Myers, Runeson
Construction markets	G&I, Hillebrandt, Warren
Transaction costs	G&I, Myers,
Theory/role of firms	Ball, Briscoe, G&I, Hillebrandt, Myers, Raftery, Shutt
Role of government	Ball, Briscoe, Finkel, Ofori, Shutt

Notes:
1. Books as listed in Section 5 'Recent Works', except Bon (1989), Finkel (1997)
2. G&I is Gruneberg and Ive (2000), I&G is Ive and Gruneberg (2000).

The number of authors and topics that have been listed under industry economics, called organisation economics in the US, is interesting, especially in the light of Brochner's argument about the importance of topics that come from industry economics as a theoretical base for CE.

One of the other interesting things about the range of topics covered in these books is the way that many of them are not found in the CE and CM journals. Examples of this are Hillebrandt's stages of procurement and market power typology, market definition as in Gruneberg and Ive, the industry as perfectly competitive (Runeson, Cooke) or not (Ive and Gruneberg), and whether the output of the industry is a product (Ofori) or a service (Hillebrandt). These would seem to be debates that would be worth pursuing, because the discussion would contribute to our understanding of the nature of the industry, the activities

undertaken, relationships between players and the theoretical foundations for CE and indeed construction management (CM). However, because these topics are not about 'research results' but rather about developing ideas, they may not be easy to get published in journals accustomed to papers based on slight survey data or ungeneralisable case studies, questionable quantitative analysis and dubious conceptual models .

MODERN CONSTRUCTION ECONOMICS

The second proposition underlying this paper is that there is a clear difference between what has been known as building economics and what is emerging as modern construction economics. Traditional building economics (one of the first books to use the term was Seeley 1972) was primarily concerned with issues around project appraisal (see Marshall 1988 for a major work on investment evaluation) and cost management and planning techniques (there are many books on cost planing, eg. Ferry et. al. 1999 now in its seventh edition). This is construction project economics, to use Ofori's term. It could be argued that the three editions of Hillebrandt's major work, *Economic Theory and the Construction Industry* (1974, 1985, 2000) also belong in this category (see Myers 2003: 103), because Hillebrandt has always emphasised the project based nature of the industry and the majority of her books are devoted to microeconomic analysis.

However, it is clear that modern CE has a wider focus than this, and has stronger links to economics and economic theory. The best examples are Bon's collected papers on input-output modelling (2000), the books by Ive and Gruneberg (2000) and Gruneberg and Ive (2000), and Runeson (2000). These books are concerned with the economics of the building and construction industry, and reflect the wide-ranging scope of modern economics.

There has also been no further development of the integrated model linking building and property markets found in *Building as an Economic Process*. Warren (1993) is one of the few text books that covers both construction and property, but in a very general way (i.e. the economics is taken to apply to both industries in the same way, which could be debatable). If the property market is the demand side of the equation and building and construction the supply side, it would seem theories showing the linkages and the channels they operate through would be an area for development (Ball 2004 has elements of this integration).

FUTURE DIRECTIONS

The Four Paths

From this review of previous work four potential paths to the future for CE have been identified Two of these are the familiar construction industry economics and construction project economics that have been seen as the traditional set of topics for the field. The third is the linking of building economics to FM that Bon advocated, which could include life-cycle analysis and the sustainability agenda of Myers. In effect this is a transfer of some of the topics in construction project economics into a new category that might be called 'facility sustainability' that focuses on the application of environmental economics

to buildings. The fourth path is the 'closer engagement with economic theories of industrial organization' that Brochner argues for.

Is this a useful division of topics in CE? These potential paths have all been trodden, to one extent or another, by researchers in the field. In particular, the first three of the paths might be better described as the 'pillars' of CE, they support the field as it stands but have not so far delivered a coherent theory, or a recognised discipline. The fourth path is perhaps a pointer to another alternative.

An Alternative Fifth

The range of macroeconomic theory has been expanding rapidly over the last decade or so. The emergence of a number of new theories and approaches that changed views (or at least challenged widely held views) on macroeconomic issues such as capital theory, the business cycle, and interest rates, provided alternatives to the neoclassical synthesis that had worked so well in macroeconomics for several decades, Examples of new macroeconomic theories include endogenous growth theory, with its emphasis on capital investment and innovation, real business cycle theory and the effect of supply side shocks, and evolutionary economics with its focus on capital, productivity and the dynamics of growth, and new Keynesian economics which emphasised the roles of time and capital.

All these theoretical approaches offered fresh insights into many (mainly macroeconomic) issues, and pointed to potential new research and policy directions. It should be noted that most of the ideas found in these new macroeconomic theories have not yet been applied to the building and construction industry. This would seem to offer potential for development of theoretical foundations and new research directions for modern CE.

CONCLUSION

The proposition that building economics is a still-emerging field does not appear to be controversial. While this can be traced back to Bon (1989), Ofori (1994) also put forward the view that building economics had not yet developed to the point where it could be recognised as a distinct part of general economics. Still later, Bon revisited the arguments in his 1989 book, starting Bon (2001:255) with "Building economics has been long in emerging because it still lacks solid theoretical foundations", and Myers (2003) followed with another view where he suggested a coherent conceptual structure was lacking.

A different approach was taken by Brochner (2000) who suggested that there were four topics for building economics to pursue, and economic theories of industrial organization offer opportunities for analysing the construction industry. Developments in the economics of information were also suggested as a theoretical foundation for research in construction economics.

From this discussion a distinction can be made between building economics and construction economics, with the former concerned with project-level analysis so that topics associated with project costs, cash flow, life cycle and investment analysis are grouped together. The latter is concerned with economic theory and industry issues. This

would appear to be an entirely sensible distinction, and leads to the five paths identified as potential paths to the future for CE:

1. Building economics, or construction project economics
2. Construction economics, or construction industry economics
3. Facility sustainability, or environmental economics applied to buildings
4. Theories of industrial organization applied to building and construction
5. New macroeconomic theories applied to the building and construction

The concept of "modern construction economics" that lies behind this paper stems from this break with the past. Broadly, building economics was not overly concerned with theory but, as the spate of publications around 2000 shows, there has been a renewal of interest in a range of theoretical issues in CE. There is now an opportunity to bring this theoretical research together and push outward its frontiers into a body of theory that is unarguably for and about CE. In doing so, this would provide a firm foundation for the future development of construction economics. A list of possible topics is given in the Appendix.

Clearly CE has not, to date, developed a theoretical base that would allow a claim for it as a discipline or body of knowledge in its own right. However, CE is not a theory-free zone. Many of the papers published in the field are explicitly or implicitly based on a theoretical proposition of some sort, usually imported from another discipline such as economics, finance, management or organisational theory. Often the theory is not elaborated at length or in detail. Generally, theory is not the focus of the research, and the paper for publication is typically about the application, because journal papers tend to emphasise research results rather than theory.

Therefore there is a need for these theoretical bases to be more fully developed and elaborated for CE is to become recognised as a discipline. Indeed, a debate over what theoretical bases are available, where they could be used, and the appropriate methodology would be useful in its own right. Perhaps more important, though, would be an ongoing debate about the characteristics of the industry, projects and participants from a theoretical perspective rather than an ongoing 'accumulation of facts' from case studies and surveys.

APPENDIX

The theoretical areas that might be covered in modern CE include:

Theory of the Construction Firm
- Strategic, managerial and production based theories
- Characteristics of construction firms and role of theory
- Transactions costs under subcontracting
- Market entry and international construction
- Technology models and construction firms

Characteristics of Construction Markets
- Identifying construction firms and markets
- Perfectly competitive markets in construction
- Imperfect competition in construction

Game theory in construction bidding and contracting
Auction markets for construction projects
Competition policy regulation of the construction industry

Projects and Procurement
Procurement and innovation
Public infrastructure and private interest
Advances in appraisal techniques for PPP/PFI projects
Technology and project management
Wicked problems and design management

Applying Macroeconomic Theory
Use of input-output data for analysis of construction industry
Asset prices, monetary policy and building bubbles
Growth, development and construction activity
Do theories of endogenous growth, real business cycles or evolutionary economics have implications for understanding construction?
The property market and demand for new building projects
Infrastructure for the 'new economy'
Measuring construction productivity at the industry level

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Warren, M. (1993). *Economics for the Built Environment*, Oxford, Butterworth-Heinemann.

Future paths forconstruction economics. Gerard de Valence Faculty of Design, Architecture and Building. University of Technology Sydney. ABSTRACT. The theoretical foundations, or lack of, and the future development of construction economics has been the subject of debate for some time. The purpose of the paper is to explain the basis for these and argue for the importance of what is being called â€œmodern construction economicsâ€. To make this argument the paper starts with two propositions. The first proposition is that CE is a still-emerging field, and the second proposition is that there is a ... Image: Future of Construction, World Economic Forum, The Boston Consulting Group. Six key ways to thrive amid disruptions. Players along the construction industryâ€™s value chain â€“ architects, designers, engineers, building material suppliers, contractors, and operations and maintenance companies â€“ need to prepare strategically and make the right moves to thrive amid the disruptions the new technologies and trends could cause. However, the myriad potential changes in the industry will make it difficult to predict the future. To help, the World Economic Forum, together with the Boston Consulting Group and more than 30 leading companies from the construction world, created three future scenarios to prepare the industry for a broad range of possible futures For construction companies, this will dramatically improve their bottom line by reducing the number of laborers needed on-site as well as reduce lost man-hours from injury. Advertisement. "ABI Research predicts the robotic exoskeleton market alone will reach $1.8 billion in 2025, up from $68 million in 2014.Â Building Information Modelling, or BIM for short, is a process of creating and managing information on a construction project from cradle to grave. This intelligent 3D model-based process has already seen wide adoption by architects, engineers, and other construction professionals. In fact, many local authorities have made BIM the standard for many of its construction project needs. Economic indicators for the construction industry are available from a number of sources, including government and professional bodies. On this page you can access reports and online resources providing statistics and commentary.Â Specialist Finance Qualifications & Programmes. Whatever future path you choose, ICAEW will support the development and acceleration of your career at each stage to enhance your career. Corporate Finance Qualification ICAEW Data Analytics Certificate ICAEW ISAs programmes. Diploma in Charity Accounting The ICAEW Certificate in Insolvency Accounting Skills Certificate.