

# REBALANCING THE CONSTRUCTION PRODUCTIVITY DEBATE

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Subcontracting is a common aspect of all construction markets but is a particular feature of countries like the UK, Italy and Australia, where similar statutory, political and regulatory changes have reduced the number of vertically integrated firms and driven increased fragmentation and self-employment in the industry. While subcontracting has produced many advantages, particularly around flexibility, it has also led to many challenges around coordination and productivity. It is therefore surprising that subcontractors have been missing from the productivity debate. To rebalance the debate, eight focus groups were conducted with seventy one of Australia's leading tier-one subcontractors. The results indicate that from a subcontractor's perspective productivity could be improved significantly by fairer and more inclusive workplace practices which provide more opportunities for subcontractor's to innovate and to share risk and reward.

Keywords: productivity, subcontractor, fairness, trust, risk, innovation.

## INTRODUCTION

There are many good reasons for Australian construction firms to improve their productivity. Numerous reports have pointed to evidence of an increasing gap between wages and productivity which in the long-term is unsustainable (AIG 2008, BCA 2012, MBA 2013). This debate is not new and neither is it unique to Australia. While Abdel-Wahab and Vogl (2011) argue that productivity research is weak on empirical evidence and Sezer and Brochner (2013) argue that construction productivity data is inherently problematic because of the heterogeneity of inputs and outputs and because of the need to account for variations in service quality, there is significant evidence that there has been a persistently low rate of construction productivity growth in many countries. For example, Jergeas (2009) found significant room for improving productivity in the Canadian construction and engineering industry. Ailabouni *et al's* (2009) research in the UAE produced similar conclusions as did Chia *et al's* (2012) analysis of Malaysian construction productivity and Abbot and Carson's (2012) productivity analysis of the New Zealand construction industry. Abdel-Wahab and Vogl's (2011) analysis of productivity trends across Europe, Japan and the US showed a widening gap between productivity growth in construction and other sectors and that Japan and Germany even showed negative growth.

Given the above, it is not surprising that there has also been a vast amount of research into construction productivity stretching back over fifty years. A review of construction management literature published in eighteen leading internationally peer reviewed journals and conferences and PhD theses over the last thirty years produced

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four hundred and eight references looking at a wide variety of issues (ARCOM 2014). While this research has undoubtedly advanced our understanding of the subject of productivity, the literature at project level reflects of the dominant power structures within the industry and almost entirely presents a principal contractor's perspective. There are only two references to subcontractors across the entire sample of articles that relate to productivity and, in the same way that ever more risk has been passed down the contractual chain to subcontractors, the productivity literature reflects an assumption that there is only one side to the debate and that subcontractors' opinions are of no value in this debate.

Given the importance of subcontractors in the construction industry, there is clearly a need for a more balanced perspective. Subcontractors are absolutely central to the construction industry's productivity since they employ the vast majority of people in the industry and represent the front-line where the physical task of construction is undertaken on site. This imbalance in the productivity debate is especially inappropriate in the construction sector. As the CFMEU (2011) points out, the construction industry employs five times as many independent contractors as any other industry in Australia and accounts for 33% of all independent contractors in Australia. The situation is the same in many other countries such as the UK and USA, where subcontracting is the dominant form of employment in the construction sector. In relatively small markets like Australia, a focus on subcontractors is likely to be even more insightful. There are a relatively few tier-one subcontractors and most tend to work with most of the nineteen major contractors which undertake the vast majority of work in the industry. In Australia, tier-one subcontractor insights therefore represent multiple insights into how major contractors' management practices influence productivity in the industry. Within this context, the aim of this paper is to explore the issue of productivity from the tier-one subcontractor's perspective. More specifically, it is to explore what needs to be done to improve productivity from a subcontractor's perspective and to identify priority areas that should be focussed on.

## **CONSTRUCTION INDUSTRY PRODUCTIVITY**

Every country faces different challenges in addressing the productivity issues highlighted above. In the UK, Horner and Duff (2001) argued that there had been precious few changes to the way construction projects had been managed over the previous fifty years and that there was huge room for improvement on most sites. The main causes of lost productivity in site were found to be: interruptions; size of the labour force; unplanned increases in labour force; working continuous overtime; poor site management; fragmentation; no focus on productivity poor productivity training; a lack of detailed planning; contractual conflict; poor design; lack of commitment to continuous improvement; a lack of trust; poor workforce consultation; productivity is not rewarded and; difficulties in measuring and monitoring productivity. Also, in the UK, Chan's (2005) interpretivistic approach to understand the factors influencing construction productivity concluded that site welfare, job prospects, skills training and qualifications were critical to sustaining long-term productivity improvements. Chan's research also discovered a chasm between white-collar managers and blue-collar operatives, and argued that more paternalistic supervision underpinned by a genuine desire to understand and respect the workforce would benefit productivity. In the US, CII (2008) analysis of over three decades of research data from the Construction Industry Institute's (CII) productivity database and field tests found that technology improvement was key to productivity improvement. While the productivity benefits of many new technologies remain untested, those that had been proven to increase

productivity included: construction automation; integration and automation of project information systems and; automated material identification and tracking systems. In Canada, Jergeas's (2009) work breakdown study of a wide range of construction trades showed that the average work time was 53.17% and that productivity could be improved by: better measuring of productivity; setting and communicating productivity targets; performance-based incentive programs; staff engagement programs and fostering a culture of productivity. Among many suggestions for improvement, Jergeas (2009) also pointed to the importance of: recruiting, educating and retaining productive and skilled workers; improved frontline management and leadership; of constructive workplace relations and scheduling that respect worker's rights and well-being; focussing. Ruwanpura's (2009) National Science Foundation project in Canada produced similar conclusions and Ailabouni *et al*'s (2009) analysis of 956 data sets across seven trades on six construction sites in the UAE found that the most significant factors influencing productivity were "*work timings, competent supervision, group dynamics, control by procedures, availability of material and climatic conditions*".

More recently, Chia *et al*'s (2012) analysis of Malaysian construction productivity census data found that 'machine-for-labour substitution' and 'industrialisation of the production process' were the main factors driving productivity. However, Abbot and Carson's (2012) productivity analysis of the New Zealand Construction Industry concluded that while productivity grew consistently up until 1975, it has been sluggish ever since, despite the introduction of labour saving technologies such as new equipment, tools and off-site fabrication.

Finally governments around the world have also made productivity a focus in recent years. The Singapore Government is arguably the most focussed of any government in driving up productivity in the construction industry and it has produced a 'Productivity Road Map' to guide this process. The Road Map comprises four strategic thrusts: introducing regulatory requirements and setting minimum standards to drive widespread adoption of buildable design and labour-saving technology; providing financial incentives to encourage manpower development, technology adoption and capability building; regulating the demand and supply of low cost foreign workforce and; enhancing the quality of the construction workforce. In the UK, the Strategic Forum for Construction, through demonstration projects, has sought to demonstrate the productivity benefits of following its six construction commitments: procurement and integration; commitment to people; client leadership; sustainability; design quality and; occupational health and safety.

## **METHOD**

To explore and add to the above literature a subcontractors' perspectives on what should be done to improve construction productivity, eight focus groups were conducted with seventy one of Australia's most prominent tier-one subcontractors. Tier-one subcontractors or Prime subcontractors are defined as those which work directly for the membership of the Australian Contractors Association (ACA) which represents the interests of major contractors that dominate the Australian Construction market. Tier-two and tier-three subcontractors are those that are employed by the prime subcontractors further down the contractual chain. Unlike tier-two and tier-three subcontractors, tier-one subcontractors have a direct interface with these large firms and were chosen because this enables them to provide the most informed insights into common industry subcontract management practices.

Focus groups are under-used in construction research, but outside this field are widely recognised as an effective way to promote interaction and self-disclosure among a carefully structured group of respondents. As Morgan (1997) and Powell *et al* (1996) explain, focus groups are a form of group interviewing which involves presenting questions to a number of people at the same time. In contrast to individual interviews, focus groups have the advantage of eliciting a multiplicity of views and emotional processes within a group context, producing additional insights from the interactions between group participants that would be less accessible without interaction found in a group setting. Listening to others' verbalized experiences stimulates memories, ideas, and experiences in participants and group interactions enable participants to ask questions of each other, as well as to re-evaluate and reconsider their own understandings of their specific experiences (Lindlof and Taylor 2002).

While badly managed focus groups can also be intimidating at times, especially for inarticulate or shy members, the skill of the facilitator is to avoid this from happening to enable a collective mind to reveal collective insights in a way which could not be done if the same number of respondents were interviewed individually (Race *et al* 1994). Effective facilitation not only relies on the facilitator but on getting the right mix of people to stimulate debate and to provide diverse opinions and experiences (Goss and Leinbach 1996). At the same time, participants need to feel comfortable with each other. So in a construction industry context it is important to avoid people who might be in conflict or competition with each other. To this end, senior managers (managing directors and directors) from tier-one subcontractors from across Australia (Western Australia, New South Wales, Victoria and Queensland) were invited to one of eight, three hour focus group workshops. Individuals were invited on the basis of recommendations from one major Table 1 Sample structure (focus groups)

Table 1: Sample structure

Focus Group	Trade	Number of focus group participants
1	Structural, Formwork, Mechanical, Façade, Groundwork, Precast.	6
2	Stone, Cladding, electrical and communications, suspended ceiling and partitions, tiling, plumbing, joinery	7
3	Concrete, Tiling, Plumbing, Steel fixing, Structural, interiors	7
4	Shop fitting, Electrical (2), Groundwork, Plaster boarding, structural, services (2), precast	9
5	Plumbing, services (2), electrical (2), Structures, Concrete, painting, civil engineering (2)	10
6	Formwork (2), groundwork, electrical (2), facade, mechanical, concrete (2), Plumbing (2)	11
7	Glass and aluminium (2), services and air conditioning (2), Painting, Lifts/elevators (2), Interiors and fit out	11
8	Joinery, electrical, services, precast (2), painting, fit out (2), fabrication, plaster boarding	10
TOTAL		71

Each focus group was transcribed, summarised and presented to the focus group participants for feedback, editing and comment. These changes were then incorporated into the final transcript which were then synthesised into one combined transcript for narrative analysis, selections of which are presented below. As Meisel (2011: 2023) points out, the power of narrative is in translating respondent accounts into data that people can comprehend... *“Stories are an essential part of how individuals understand*

*and use evidence*". Clearly, from over thirty two hours of focus group discussions, it is not possible to recount everything that was said in this paper. So what is presented are the main points which were issues of agreement across all the focus groups.

## DISCUSSION OF RESULTS

All respondents felt that productivity was strongly influenced by the quality of relationships on a project .. *"its all about relationships"* [Respond #60]. .. *"relationships are everything"* [Respond #44]... *"A good team can make a huge difference to productivity .. 20-30%"*... [Respond #7]. This data supports Chan's (2005) study which pointed to trust and respect between managers and workers being critical to productivity. However, in contrast the existing literature on productivity, tender practices also emerged as a strong recurring theme in the discussions. Timing, ethics and opportunities for innovation were the recurring themes which emerged from our discussions. As one respondent said.. *"There is no time to innovate. Tender periods are too short. .."* [Respond #39].... *"Subcontracts are let too late, especially if you are an up-front subby. We don't have time to plan"*. [Respond #23].... *"our experience is that our innovations are shared with competitors and used against us. So we keep any innovations in our back pocket. Trust and integrity is all too often missing"*. [Respond #16].... *"We hold back our smarts because we know they will share our IP. If there was more trust then we could contribute a lot of smarts up-front and make the project much faster"* [Respond #43]. While the repeated references to the ethics of tendering were new insights in the productivity debate, references to innovation were also significant since there has been a large amount written about this subject in the construction industry (Abbot *et al* 2007, Sexton *et al* 2008, Gambatese and Hallowell 2011). Our study provides, for the first time, specific evidence of a potential link between innovation and productivity which needs to be explored further. Another significant insight was the importance of good design as a driver of productivity. Poor design was identified by numerous authors such as Horner and Duff (2001) as a barrier to productivity but our study also notes, in support of Koskela *et al* (2002) that the quality of design documentation and design management is a major problem ... As a respondent said ... *"Jobs are being designed on the run – often behind construction.. This was seen as a particular problem on design and construct projects where the architect is novated to the contractor. A number of subcontractors argued that their loyalties often remained with the client and that they had already exhausted their fees. So .. as one respondent said.. "they are reluctant to do any more work."* [Respond #12].

There was also a widespread perception that the quality of management and supervision was compounding this problem, driven by an aging workforce and by an increasing reliance on graduates with little work experience to undertake site management roles. .... *"Companies are losing the older staff who understand how to build"*. [Respond #2]... *"the best site managers are from the trades ... They are the better supervisors since they know how to build and have more empathy with subby problems and challenges"*. [Respond #8]. One specific area of declining competence was in site scheduling and planning, supporting the findings of CII (2008) and Jergeas (2009). Our respondents suggested that in line with the tendency for principal contractors to transfer ever more risk to subcontractors, there was a growing tendency for main contractors to absolve their responsibilities in this area. ... *"Poor coordination is a major problem. Subcontractors are left to coordinate themselves"* [Respond #44].

Our findings also supported Horner and Duff's (2001) warning about the potential productivity implications of continuous overtime and unplanned increases in labour. However, it also extends Lingard's (2004) research on 'burnout' in the construction industry into the realm of subcontractors. 'Burnout' was a word that was regularly used by respondents to describe the impact of the problems discussed above on subcontractor site labour... *"..We work double shifts, overtime and night shifts. It's more of a catch-up speed rather than a start-to-finish speed. People are getting burnt-out"* [Respond #16]. The potential causes of burnout posited by our respondents were numerous and included references to poor planning and scheduling of work. However, they also pointed to a growing administrative burden on projects, especially around safety and environmental "green" compliance. *"..The volume of information on projects is becoming overwhelming and a serious burden. On some projects, it is not unusual for a subcontractor to have 40% of his workforce non-productive"* [Respond #19]... The perceived causes of this problem were principal contractors' over-reaction to new government regulation; poor document control and; inexperienced supervisors...

Finally, in support of Jergeas (2009) but in contrast to many other studies on construction productivity, all of the respondents identified industrial relations (IR) as a major productivity issue in the construction sector. In Australia, many subcontractors have to sign-up to Enterprise Bargaining Agreements (EBAs) which dictate minimum wages and entitlements for their workers. Controversially, union delegates are often employed on construction sites (and paid by contractors) in order to monitor the implementation of these agreements and to smooth industrial relations on site to keep a site productive. EBAs and the union delegates who enforce them were both a major concern among the respondents... *"If we know a certain delegate is on a job then we could price it 20% higher or even not price it at all. They make a huge difference to how the job runs. Some are reasonable to want to help. Others have their loyalties to the unions and can disrupt a job hugely by calling stoppages"* [Respond #38].

## CONCLUSIONS

The aim of this paper was to explore the issue of productivity from a subcontractor perspective. The vast majority of the literature in this area takes the client's and contractor's perspective and there is a need for a more balanced approach which reflects who actually does the work. In general, across the seventy one major tier one subcontractors interviewed, there was widespread agreement on what needs to be done to increase productivity. While one could also argue that there is an equal tendency to point the finger and blame outsiders in the subcontracting fraternity as there is among main contractors, these views at least as a counterpoint to the dominant view represented in the current construction management literature. In particular it indicates that more attention needs to be given in this literature to tender practices (ethics and timing) to enable innovation and productive relationships to emerge. The ageing workforce is also an emerging issue around competency development as is design management and industrial relations. In terms of practical recommendations, our results indicate that contractors should avoid bid shopping, respect subcontractor IP, provide more time for pricing and involve subcontractors earlier in the process. Contractors should also encourage innovation and build trust by integrating their supply chain by sharing risks and rewards with subcontractors, forming supply chain partnerships, pursuing collaborative procurement and focussing on value not cost. There is also a clear need to up-skill junior staff in project management, planning, scheduling and coordination, communication, relationship building and business

ethics. Going forward, further research might explore the alignment of views about productivity between subcontractors and principal contractors and explore any differences which in themselves may be a cause of lost productivity in the sector.

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