Economic Sociology and Australian Biotechnology

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Abstract
This paper draws upon interviews with the CEOs of 14 Australian biotechnology companies to explore the relevance of the new economic sociology in understanding economic behaviour. In the course of interviews, CEOs regularly described ‘cheap scientists’ as a comparative advantage of the Australian industry, consistent with neo-liberal economic theory. At the same time, interviews also drew attention to a variety of social and political factors that shaped the local industry, consistent with the new economic sociology. These included first, the pivotal role of public research organisations in generating the intellectual property of the local industry; second, the distinctive career pathways of entrepreneurs; third, the influence of local public research organisations and venture capitalists in creating local clusters; fourth, the network structure of biotechnology companies, both at local and international levels; fifth, the search for stability and survival in the context of industry instability; and sixth, the demand to generate convincing ‘stories’ or models of how their companies would prevail, notwithstanding instability. The paper concludes that the new economic sociology provides compelling tools for understanding the biotechnology industry in Australia.

Introduction
Since the 1980s there has been a resurgence of sociological inquiry into the articulation between the economy and society. This resurgence has occurred in the US, and to a lesser extent in Europe. It has barely registered in Australia. In a recently-published article in the Journal of Sociology I have argued for engagement with the new economic sociology in the Australian context (Gilding 2005). In this paper I use my current research on the Australian biotechnology industry to highlight some of the themes of economic sociology, and demonstrate how economic sociology can contribute towards a richer understanding of economic behaviour.

Markets as social institutions
The dominant neo-liberal economic paradigm views markets as mechanisms that bring together buyers and sellers. They do so in a way that is not obvious; hence the expression the ‘hidden hand’ of the market. Price is the key to the hidden hand,
coordinating the anonymous activities of buyers and sellers. When prices are high (there are too many buyers), sellers step up their activity and make more widgets. When prices are low (there are not enough buyers), sellers make less widgets and shift their activity into more profitable products. There is relentless competition as sellers try to sell more widgets for more profit, and buyers try to find the best value for their money.

The dominant economic paradigm has its roots in Adam Smith’s ‘Great Synthesis’ in the late eighteenth century (Trigilia 2002: 21). It was overshadowed by the Keynesian account in the wake of the Great Depression, placing more emphasis upon the role of the state at the expense of markets. From the 1970s there was a resurgence of neoliberalism, resulting in ‘the overwhelming dominance of the discipline of economics in policy debates’ (Biggart 2002: xiv). In turn, the growing prominence of economic sociology was at least partly a response to neo-liberal hegemony. It was also the outcome of new industries such as IT and biotechnology, giving rise to new patterns of economic and organisational behaviour (Powell 1990; Saxenian 1994).

In the first instance, economic sociologists directed their analysis against the anonymous and atomistic conception of markets. Harrisson White (1981) observed that markets are ‘tangible cliques of producers observing each other’. White emphasised the role of ‘upstream producers’ in particular. Pressure from buyers, he argued, ‘creates a mirror in which producers see themselves, not consumers’, as they strive to achieve market equilibrium (1981: 543-4). Similarly, Mark Granovetter argued that the ‘anonymous market of neoclassical models is virtually nonexistent in economic life’, and ‘there is evidence all around us of the extent to which business relations are mixed up with social ones’ (1992: 65). He described the interpenetration of business and social relations in terms of the ‘embeddedness’ of markets.

From the 1990s there occurred a renewed interest in the classical tradition of economic sociology (Trigilia 2002), including Simmel, Sombart, Weber, Durkheim, Veblen, Polanyi and Schumpeter. Key themes included the critical role of legitimacy in the formation of markets, the influence of social and political institutions in
economic development, innovation and entrepreneurship, and the socio-cultural factors that condition consumer preferences (Trigilia 2002: 125-34).

During the same period there was a ‘huge expansion of empirical work’ in economic sociology (Fligstein 2001: 6). This research established the wide variety of market structures across societies, coordinating suppliers, competitors and customers in different ways. In particular, it drew attention to the distinction between markets, hierarchies and networks as alternative means of conducting transactions; the different ways in which firms articulated with each other, including ‘network’ relationships; the diverse role of the state in setting the rules for markets; how the search for stability influenced economic behaviour, over and above price competition; and the role of meaning in economic transactions (Powell 1990; Fligstein 2001; Biggart 2002).

**The current study**

From its beginnings sociologists took an interest in the biotechnology industry. Three themes were prominent. First, sociologists described the biotechnology industry as an exemplar of the influence of social networks in economic organisation (Powell 2001). Second, sociologists addressed the role of the state, both in terms of promoting the industry and regulating it (Bauer and Gaskell 2002; Löfgren and Benner 2003). Third, sociologists addressed the issue of legitimacy, and how public opinion was a ‘crucial constraint, in the dual sense of the limitations and opportunities for governments and industries to exploit the new technology’ (Bauer and Gaskell 2002: 1).

This paper is part of a larger project concerned with clusters and networks in the Australian biotechnology industry. It is based on interviews with 14 CEOs of Melbourne-based biotechnology companies, undertaken as part of the groundwork for the project. All of the companies involved mainly diagnostic and therapeutic applications of biotechnology. Nine of them were listed companies, which meant that they were disproportionately large compared with most local biotechnology companies. The interviews were primarily concerned with clusters and networks. As it happened, they covered a lot more ground. This paper elaborates upon six themes:
price competition, the state, clusters and embeddedness, networks, survival of the firm, and meaning.

The interviews were conducted in 2003 and 2004, almost all at company headquarters. The CEOs included 13 men and one woman; their median age was 48; and all but one was an Australian citizen. Some did not mind being identified; some minded very much. On this account, pseudonyms are used throughout this paper. Where respondents did not want to be identified, their remarks are deidentified. No such measures are taken with those respondents who were not concerned with being identified.

**Price competition**

Most CEOs addressed price competition in the course of interviews. Consistent with neoliberal theory, they observed that Australia had a comparative advantage over the US and Western Europe insofar as it had ‘cheap scientists’. This was a significant consideration in making decisions about location. For example:

> The focus, the centre of gravity of the R&D of [our business] should be in Australia. Because it’s cheaper to do research in Australia, probably half the price, and that gives us a significant advantage. *(Jack Salter)*

> There are enormous costs to running laboratories in the US and we have very low costs [here]. *(Andrew McCabe)*

> I mean if we went to America … well, we’d just have three times the costs. So all the companies who’ve said America’s such a great place to be, have come back with their tail between their legs, run out of money. *(Francis Ganly)*

**The state**

Notwithstanding ‘cheap scientists’, CEOs overwhelmingly observed that their businesses were located in Melbourne because this is where the technology was invented. More than this: the technology was invented at one of the state-funded Melbourne-based public research organisations, such as the Walter and Eliza Hall Institute, Monash University and the Murdoch Royal Children’s Hospital. This is not
surprising. As Stephen Tyler observed, ‘90% of the infrastructure of biotechnology research [in Australia] is in public research institutions – that’s the resource’.

Informants were unambiguous about the influence of the public research organisations, but they were nonetheless often critical of their culture. For example, Tyler elaborated:

> The question is how can we make that resource relevant to development programs, and develop and commercialise a working partnership with people who do it? And the first thing to say is that there are no success stories. Not one of an institution commercialising and developing a pharmaceutical product themselves! Of all the billions of dollars that have gone into this industry, there is not one example whereby an institution has successfully taken it through to results.

**Entrepreneurs**

Most of the informants had postgraduate qualifications of some sort in the life sciences. Their pathways to their current positions included public research organisations, the international pharmaceutical industry, and the local biotechnology industry. The majority had come into the businesses of which they were CEOs when the businesses were already established. Generally they described themselves as ‘professional managers’, distinguishing themselves from ‘entrepreneurs’. In contrast, three informants had been pivotal in forging their companies, including putting their own money into it. Two of these informants were comfortable with calling themselves ‘entrepreneurs’; one was not.

The entrepreneurs described more idiosyncratic career pathways than other informants, wherein they felt alienated from conventional pathways. For example, Robert Tracey reflected:

> What I learnt early on is that – and it came from my grandfather on my mother’s side who used to say, you know – ‘scientists and engineers: always on tap, never on top’. And he was dead right …

> Because lots of business people want to put technical people into this ‘always on tap, never on top’ bottom category. It makes them comfortable. What makes them bloody uncomfortable is somebody that can walk into the room and argue every point and understand the technology deeply in the same breath. And that’s the sort of person that I have always wanted to be …
In close connection, the entrepreneurs were especially alienated from what one informant called the ‘peer groups’ – that is, the power brokers of public research organisations. For example:

The people who are tied up within the peer groups in Australia are absolutely useless when it comes to managing biotech companies … It’s just that they get caught up in the culture, and they make decisions based on their peer group, and their politics within the peer groups, rather than rational decisions required to move forward. *(Stephen Tyler)*

**Clusters and embeddedness**

CEOs described two dynamics that underpinned regional clustering of the industry. First, local public research organisations had invented the technologies that were the basis for their own companies. Second, early commercialisation had been driven by local entrepreneurs, and funded by local venture capitalists and business ‘angels’. Thereafter CEOs described how ‘embedded’ institutional and personal relationships were one factor that kept them in Melbourne. For example:

We of course had the collaboration or the relationship with [a major Melbourne hospital], and so we’ve got a group of scientists out there that we have this contract relationship with ... *(Howard Iser)*

So yes, there is a rationale for that [moving operations to the US], but it … would certainly lead to certain domestic issues on a major scale. *(Robert Tracey)*

Well, I’m not going to shift anywhere for a start. As long as I’m the CEO, it will be here. It’s lifestyle: kids, all that sort of thing, opportunity. *(Stephen Tyler)*

**Networks**

Informants came from the larger biotechnology companies in Melbourne, but their companies were nonetheless small and focused. This was possible on account of extensive outsourcing and partnering. A few described their companies as ‘virtual’, although they resisted the expression. Paul McQueen, for example, reluctantly described his business ‘as a virtual pharmaceutical company’. He contracted out all of the research, while the tiny ‘in-house group’ was ‘responsible for project managing or coordinating that research activity’. Similarly, Robert Tracey described how clinical
trials, research, manufacturing, distribution and services were outsourced. This removed ‘all sorts of problems of maintaining staff [and] capital’, but ‘it does have the downside that you’ve got a constant contracting management issue and it’s not always routine’. Accordingly, one of his biggest challenges was ‘just managing everybody’s expectations of what’s going to happen; how much they're going to get and who’s going to do what for whom’.

On a wider scale, CEOs described how they were compelled to forge international networks, or ‘partnerships’. As Peter Watts bluntly stated, companies ‘go offshore … [because] the market is offshore’ – mainly in the US and Europe. In this context, CEOs had no choice but to travel regularly to the US and Europe in order to maintain and build their networks. For example:

> It’s important to go in there and establish your research credibility with people who are known in the United States and then sort of link out from those people. *(Stephen Tyler)*

> [I go overseas] mostly to visit prospective pharmaceutical company partners. They're all in the US or Europe, and I go for meetings and discuss the data and further that relationship because that always takes time. It’s not going to just take one meeting and then do a deal - you’ve got to prepare for it. *(Francis Ganly)*

**Survival of the firm**

The markets for Australian biotechnology companies are overseas, but they are not conventional markets. They are overwhelmingly constrained by regulatory regimes, including patents and safety standards. In turn, ‘producer markets’ - consisting of the giant pharmaceutical companies (or ‘Big Pharma’ as they are commonly called) and other biotechnology companies – play a critical role. Jack Salter explained:

> This is not an industry where your opportunities are generally constrained by competition. It’s an industry where your opportunities are constrained by the size of the market. The size of the market for biotech deals [with ‘Big Pharma’] is about ten billion dollars a year and that’s what we’re fighting for a share of. In a generic sense we have competitors. We have the other five thousand biotech companies in the world who are vying for a share of that each year and there are only five hundred deals done so … the odds aren’t great that you're going to get a decent deal. But that’s what we're all aiming for.
CEOs were very clear about one thing: they did not want to compete in fragmented, low-margin ‘commodity’ markets, grounded in price competition. This was the problem with agriculture and some of the new genetic services industries, such as DNA paternity testing. On the contrary, the CEOs’ efforts were dedicated to creating – in their own words – ‘high value differentiated products’ that were ‘protected’ through patents. In the terms of the US sociologist Neil Fligstein, they were trying ‘to differentiate their products to form niches to protect themselves from price competition’ (2001: 71). More generally, they were focused upon the ‘survival of the firm’.

**Meaning**

CEOs acknowledged that the biotechnology industry was volatile. Most of their companies were not turning an operating profit. Most rested their hopes on a deal with Big Pharma, while acknowledging – in Salter’s words – that ‘the odds aren’t great that you're going to get a decent deal’. The Managing Director of one foreign-owned company (interviewed along with some other informants for background information) was particularly pessimistic about the prospects of the industry in Australia:

> Very few of the Australian companies are profitable. The sad thing is that they're burning through the money and they’ll eventually crash and go down. If that happens then the industry will be very much on the nose and the problem is that the time frame for biotech companies is huge and the risk is enormous ... On the whole the prospects for Australian biotech are poor. *(Eric Cassidy)*

In this context, the informants were under heavy pressure. In the course of interviews they constantly referred to other companies as models of how to do things or not to do them. In the process they described competing models for making their businesses work. In Fligstein’s terms, CEOs come up with ‘myriad cultural solutions to their collective problems of price competition’ (2001: 71). Fligstein described these solutions as ‘conceptions of control’. When a market is emerging, the situation is fluid. Many firms are forming, all with their own conceptions of how the market will develop. The politics at this stage resembles social movements. Perhaps this is why CEOs were so emphatic in presenting the merits of their own conceptions of how the
market was developing. After all, they necessarily pitched their own stories to potential research partners, investors, Big Pharma, the media – and me. For example:

> We had a view, a very passionate view over a period of time – particularly when we did some experiments – that the world had overlooked something here. And the more we did the work, the more we believed we were right. *(Allen Trainer)*

> Well you know the Australian government and the Australian industry cannot compete with the US industry. So if you can't beat them you have to join them. And my advice has always been: build a bridge to the US ... That’s what [my business] is trying to do. *(Jack Salter)*

**Discussion**

The neo-liberal economic paradigm can be usefully applied to the biotechnology industry in Australia. Not least, CEOs of biotechnology companies consistently describe ‘cheap scientists’ as a comparative advantage of the Australian industry. Yet cheap scientists only go part of the way in understanding the Australian industry. Economic sociology draws our attention to the role of the state, the sources of innovation and entrepreneurship, the effects of regional clusters and embeddedness, the influence of local and international networks, the search for stability among economic actors, and the influence of meaning in economic behaviour. It provides compelling tools for understanding the biotechnology industry in Australia.

**References**


