Visualising the interdisciplinary research field: the life cycle of economic history in Australia

Abstract

Interdisciplinary research is frequently viewed as an important component of the research landscape through its innovative ability to integrate knowledge from different areas. However, support for interdisciplinary research is often strategic rhetoric, with policy makers and universities frequently adopting practices that favour disciplinary performance. We argue that disciplinary and interdisciplinary research is complementary, and we develop a simple framework that demonstrates this for a semi-permanent interdisciplinary research field. We argue that the presence of communicating infrastructures fosters communication and integration between disciplines and the interdisciplinary research field to generate innovative knowledge. We apply this to the experience of economic history in Australia in the second half of the twentieth century to demonstrate the lifecycle of a semi-permanent interdisciplinary research field.

Keywords

Interdisciplinary research, disciplinary research, economic history, innovation, communicating infrastructures, research management

1. *Introduction*

Governments and universities frequently extol the virtues of interdisciplinary research – research that breaks down traditional disciplinary boundaries and integrates diverse knowledge in order to tackle the large and complex problems of modern societies. However, though the benefits of interdisciplinary research are largely accepted, often government and university policy favours disciplinary practice. The institutional organisation of universities, the structure of degrees, funding opportunities, research evaluation, and the appointment and promotion of staff generally reinforce the dominance of major disciplines.

Rather than viewing disciplinary and interdisciplinary approaches as competitive, we argue that they play complementary roles in a nation's research infrastructure. The innovative benefits of interdisciplinary research are best realised through integrating the expert knowledge and intellectual foundations from larger disciplines. Further, maturing disciplines necessarily build structures that foster inward communication, risking insularity and separateness. This separateness provides empty spaces in which interdisciplinary research can flourish. The agency of interdisciplinary research in bridging the empty spaces between disciplines can take a number of different forms. We focus on the dynamics of the semi-permanent interdisciplinary research field, which is distinctive because of its sustained *communicating infrastructures* that foster communication and integration between members of the field and their parent disciplines to generate innovative knowledge.

To visualise the development of an interdisciplinary research field over time, we examine Australian economic history over the second half of the twentieth century. This field grew from a group of disconnected solitaries, to one with sustained institutional autonomy, a number of distinct intellectual traditions, and extra-university structures that fostered communication and identity among members of the group. Over time, these structures fostered inward-looking communication, and resulted in narrowing intellectual contributions and the reduced ability of the field to perform its communication and integration roles. External pressures from the 1990s forced the field to look outwards, and over recent years there is evidence that Australian economic history is once again occupying the interdisciplinary space.

2. *Interdisciplinary thinking versus disciplinary practices*

A scientific discipline is "a specialised field of knowledge" that represents "historical, evolutionary aggregates of shared scholarly interest" (Chubin, Porter, Rossini and Terry 1986, 4). Its scholarly community advances disciplinary knowledge through a shared set of professional practices, key concepts, theoretical backgrounds, and technical skills. Common values and norms facilitate collaboration among the discipline's scholars (Burt 2000; Coleman 1988; Nahapiet and Ghoshal 1998; Nieves and Osorio 2013; Whitley 1984). However, the practices, belief systems and institutional structures that bind them as a group route communication inward, meaning much more effort must be made and risk taken to breach disciplinary boundaries (Frodeman and Mitcham 2007; Jacobs and Frickel 2009; Klein 1996a). Indeed, some writers have referred to a tribe mentality that creates insularity and silo behaviour, excluding potential innovators, and discounting the theoretical contributions from other knowledge domains (Becher and Trowler [1989] 2001; Ding 2011).

Interdisciplinary research (IDR) generally lacks the traditions, infrastructure and deep learning of disciplinary practice but is free from the barriers that constrain the flow of ideas beyond individual disciplines. It is a mode of research that integrates concepts, methodologies or perspectives from two or more disciplines (National Academies 2005). IDR is seen as a source of innovation and scientific breakthroughs (Bonaccorsi 2010; Jacobs and Frickel 2009; Rafols et al. 2012). It is also seen as necessary to address complex problems of the modern world that frequently transcend disciplinary boundaries (Kuhn [1962] 1970; Lyall and Meagher 2012; Page 2007; Rafols et al. 2012). As Popper (1963, 88) once reminded us: "we are not students of some subject matter, but students of problems. And problems may cut right across the borders of any subject matter or discipline".

The benefits of IDR are regularly extolled by universities and governments. "Interdisciplinary research has delivered much already and promises more – a sustainable environment, healthier and more prosperous lives, new discoveries and technologies to inspire young minds, and deeper understanding of our place in space and time" (National Academies 2005, 1). The UK government contends that IDR should be central to public science and technology investment (HM Treasury 2006), while the Australian government emphasises the link between interdisciplinarity and innovation. While paying extrinsic attention to, and advocacy of, IDR, in practice it is the unit of the discipline that shapes much of the operational behaviour of universities, government departments, and peak professional bodies (Woelert and Millar 2013).

The modern university bears the hallmarks of its long institutional history — organised in faculties, schools and departments along disciplinary lines, driven particularly by enlightenment science, the rise of the professions, and the need to understand the state and the market (Abbott 2001; Green 1974; Lattuca 2001). The discipline remains the principal currency of the university degree, most of which require specialisation in a disciplinary major. Higher degree students might be better equipped to bring together research across several disciplines to address their hypothesis but, in practice, straying beyond the traditional disciplinary boundaries faces the challenge of finding a suitable supervisory team and sympathetic examiners (Rhoten and Parker 2004). Research groupings might be the most fruitful area for promoting IDR in universities – by bringing together scholars from different disciplines to work on a common problem, they can function as intra-university 'boundary organisations' that serve as a counterweight to disciplines (Jacobs and Frickel 2009). The incentive and reward structure of university appointments and promotion, however, reinforce the disciplinary hegemony. Appointments are normally made into a specific discipline after assessment by members of the 'tribe', and promotions emphasise publishing in the 'right' places. This disadvantages IDR, as single discipline journals are systematically ranked higher than interdisciplinary ones due to the superior citation rates that occur within the disciplinary tribe (Rafols et al. 2012).

University perspectives follow closely the approach of peak sector research bodies, whose committees are largely populated by academics. In many nations, research assessment exercises regularly evaluate performance, providing detailed results focussed upon individual disciplines (Whitley and Gläser 2007). Evaluation, again, is based upon criteria that favour within-discipline publishing traits. Studies have found that assessment of research by such classifications can reduce the scope available for pursuing interdisciplinary and more unorthodox research (Gläser and Laudel 2007; Nowotny et al. 2001). Further, the disciplinary focus of evaluation bodies may structurally disadvantage IDR by encouraging universities to game-play the results – to "hide rather than highlight the interdisciplinary nature of their research" (Woelert and Millar 2013, 764). The procedures of grant awarding bodies are typically structured by disciplinary clusters and assessment by peers is heavily influenced by disciplinary markers. While senior assessors might be chosen for their breadth of understanding, in practice there is a heavy reliance on the written reports of discipline specialists. The success rate for interdisciplinary applications for the European Research Council have been found to be lower than for single-discipline applications (Shapiro 2014, 1). A recent study shows a similar pattern in Australia, with a lower success rate of applications that involve diverse knowledge bases (Bromham, Dinnage and Hua 2016). National learned academies stand somewhat more independently from government than the universities and grant-awarding bodies but also serve as advisers to government on research policy and receive financial support in return. Fellows, who are organised into disciplines, are generally senior members of one of the tribes.

The 'paradox of interdisciplinarity' (Woelert and Millar 2013) between the rhetoric emphasising the need for IDR and policies that systematically bias against it arises because evaluating IDR is challenging, indeed the variety of tasks seems to resist the development of a single standard (Klein 1996a; Klein 1996b). Adequate assessment of IDR requires taking seriously the 'integrated whole', not just the individual disciplinary components (Grigg 1999, 25). What seems to be missing is not so much the need to overturn these 'tribes' of disciplinary practice, but rather the means to bring them together more effectively - filling the empty spaces or voids that separate them.

3. The interdisciplinary research field

As we have noted, there appears to be a disconnection between the advocacy of interdisciplinary approaches in strategic thinking and the frequent adoption of disciplinary practices and structures in policy implementation. How should we rebalance or reconcile the bifurcation between thinking and practice?

The traditional interpretation of disciplinary and interdisciplinary work views them as separate, often competing, modes of knowledge production, where IDR is either an historical residual of disciplines in their evolving stages (Abbott 2001), or largely operating within a different system (Turner 2000). Increasingly, however, the literature rejects the idea of mutually exclusive domains in favour of a complementary research system (Aram 2004; Bonaccorsi 2010; Frodeman and Mitcham 2007; Pfister 2015). Rather than it representing the weakening of disciplinary boundaries, "true interdisciplinarity is found in those fields in which disciplinary science has been *more* successful" (Bonaccorsi 2010, 362). This complementarity reflects a division of labour - disciplines provide coherent intellectual foundations for broad interdisciplinary projects – logical taxonomies, specialised vocabularies, verified bodies of theory, and systematic research techniques (Fuchsman 2009, 72-3; Bonaccorsi 2010; Burt 2000).

Critically, the maturing of disciplines leads to increased specialisation of thinking and the building of supporting infrastructure that risks insularity, inward thinking, and communication with the broader research community that is constrained by discipline-specific protocols. As disciplines turn inwards, this creates voids or empty space (*le vide*) between them in which IDR may flourish. The emptiness between different forces or groups has been associated more generally with creative space. In the corporate world Jean-René Fourtou, former CEO of chemical manufacturer Rhône-Poulenc, argued that *le vide* ('the emptiness') is crucial in creativity: "Shock comes when different things meet. It's the interface that's interesting […]. If you don't leave *le vide*, you have no unexpected things, no creation" (Burt 2004, 350). The innovativeness of empty spaces has been illustrated through the metaphor of jazz improvisation. The empty spaces that characterise jazz music (as opposed to classical or rock music) produce ambiguity as to the way forward, but open the way for improvisation and creativity as any of the musicians takes the tune in a variety of directions which, if done well, contributes innovatively to the music (Hatch 1999, 85). IDR can be viewed similarly – though there are challenges associated with the ambiguity of theoretical frameworks and methods, the innovativeness of IDR is only possible within such an open research structure. Bringing disciplinary knowledge closer together in the creative void facilitates the production of new, innovative knowledge (Fuchsman 2009). IDR also has the ability to connect disciplines, changing what they do by providing paths of communication and channels to renegotiate disciplinary boundaries and generate new theoretical or methodological frameworks (Jacobs and Frickel 2009, 57; Klein 1996a; Rhoten and Parker 2004).

The agency of IDR in bringing together disciplines to create new knowledge can take different forms. *Specific projects* may be so pressing in the range of necessary knowledge that discipline scholars come together, either through the efforts of some tribe members or a push from above. The likelihood is that that the communication imperative atrophies with completion of the project. Universities and governments, conscious of the need to fill the void between disciplines, may create research centres to bring together scholars from different disciplines. However, unless there is a strong underlying continuing commitment from tribe members, the structure is likely to evolve into a series of discrete disciplinary groups and projects under a *multidisciplinary* funding umbrella. Initial attempts to find common ground by more heterodox (boundary) members of several tribes may lead to *re-absorption* into a dominant discipline, in some cases this may be intentional behaviour to colonise gaps and expand the tribal domain! Finally, initial attempts to find common ground among a number of disciplines may lead to fragmentation. Lacking distinct characteristics, the IDR becomes too kaleidoscopic and falls apart through lack of shared ideas, concepts, and methods. None of these forms of IDR are enduring.

In this paper, we identify and illustrate a more enduring agent of IDR that we refer to as the semi-permanent interdisciplinary research field (IDRF). The IDRF, we argue, occurs among a small number of closely related disciplines, perhaps as few as two. The IDRF may emerge through both internal factors such as intellectual trends, and external factors such as government policy or university structures. To better understand how an IDRF might emerge we draw upon Frickel and Gross's 'general theory' of scientific/intellectual movements (Frickel and Gross 2005, which in turn incorporates elements from a number of earlier models of disciplinary development such as Collins 1975; Fuchs 1993; Kuhn [1962] 1970; Lakatos et al. 1980; Mulkay et al. 1975; Mullins 1973; Whitley 1984). They argue that an intellectual movement emerges to challenge received wisdom or dominant ways of thinking. High-status scholars harbour complaints against prevailing intellectual tendencies and have the impetus to take on the risk of formulating a new, innovative research program supported by structural conditions that allow scholars access to resources. Rather than emerging spontaneously, intellectual movements involve actors assessing the opportunities available to them, and working with others to harness the resources at their disposal. These structures involve university departments, publications, informal personal and institutional networks, and scholarly organisations. Sustaining an intellectual movement requires the recruitment of new members, either through graduate training at key institutions, or conferences where ideas are shared and others can be convinced of the validity of the innovation.

We argue that IDRFs resemble an intellectual movement in their emergence phase. By forming through a combination of internal and external factors, IDRFs are characterised by intellectual leaders, social organisation and a certain amount of institutional space. However, what distinguishes an IDRF from a discipline, and from more ephemeral agents of IDR, is that it develops *communicating infrastructures* that help to sustain the close contact among both members of the field, and between the field's 'parent' disciplines. The concept of the communicating infrastructure is ordinarily associated with the technology of an electronic or physical network such as wireless radio waves or historical telegraph systems designed to deliver information more efficiently. It has also been applied to inter-organisational relationships in the business community. Communicating infrastructures are the "constructs that incorporate social and cultural, psychological, behavioural and linguistic elements" in the transfer of ideas and information between people and groups from different organisations (Boyce 2006, 28). In other words, in the case of IDRFs, communicating infrastructures are the social, institutional, and intellectual elements that facilitate the connection between disciplines and the interdisciplinary space, serving as negotiating frameworks to help to break down barriers that emerge between disciplines over time.

By developing communicating infrastructures, the role of the IDRF is thus two-stage – *communication* opened among disciplines and the *integration* of disciplinary expertise to generate new knowledge as a result of their coming together. Fig.1 provides a stylised visualisation of this framework.

<<FIG 1 HERE>>

Fig.1 The semi-permanent interdisciplinary research field

As the IDRF becomes established it may develop its own name and strengthen its communicating infrastructures. Indeed, there is a risk that it may begin to look more like a discipline. This resembles one possible 'death' of an intellectual movement through its transformation into a more stable, quasi-disciplinary institutional form. On the other hand, the infrastructure may not prove powerful enough to sustain the IDRF. This represents the other possible 'death' of an intellectual movement – through the gradual dispersal of scholars and resources (Frickel and Gross 2005). Our final option goes beyond Frickel and Gross' theory, with the new IDRF remaining as a narrower, but long-lasting "hybrid" (Raasch et al. 2013, 1139). It will retain a degree of intellectual and institutional autonomy, whilst maintaining its links to larger disciplines. Thus, we argue that IDRFs are characterised as semi-permanent – they may change in character and disappear entirely, contingent on the internal and external factors that brought them into being in the first place and the nature of their communicating infrastructures with disciplines.

To help us visualise the development of an IDRF over time, and the role it can play in drawing together major disciplines, we examine the evolution of economic history in Australia over the second half of the twentieth century. This IDRF initially followed the stages of formation and growth as an intellectual movement before reinventing itself as an interdisciplinary field.

4. *Occupying the space and forging the connections: economic history in Australia*

Though contemporary interdisciplinary fields have been the subject of interest in recent years (Gable, Gregor, Clarke, Ridley and Smyth 2008; Gibson 2007; Pfister 2015; Raasch et al. 2013), longitudinal historical studies revealing evidence of lifecycle progression are quite rare. An exception is Boden's (2006) history of the long-lasting cognitive science field. We share the view of Jacobs and Frickel (2009) that historical perspectives have much to offer, especially through lessons that can be learned only in hindsight from the successes and failures of interdisciplinary fields.

4.1 Origins and growth

Economic history in Australia has its origins in the early twentieth century, with the four volumes of Timothy Coghlan's *Labour and Industry* (1918) representing the first work with a national consciousness and a concern for recording Australia's economic progress over time. Coghlan, along with Edward Shann and Brian Fitzpatrick in the interwar period, formed the core of the ‘analytical school’ (Lloyd 2015, 53). An emphasis on quantitative material, inherited from Coghlan’s role as the NSW government statistician, was combined with a causal narrative presentation and an implicit use of economic theory (Lloyd 2015; Schedvin 1979, 543). Economic history had occupied a place within Australian universities since Shann’s appointment as the Foundation Professor of History and Economics at the University of Western Australia in 1912. Although the subject did exist both intellectually and institutionally before World War Two, it was characterised by scattered practitioners with little social, intellectual or professional organisation.

Following World War Two, economic history began to blossom as an intellectual movement in Australia and overseas. This was due in part to an increased interest in the process of economic growth as nations planned their future expansion from the ashes of World War Two. Simon Kuznets in the US, Phyllis Deane and W. A. Cole in the UK, and Jean Marczewski and colleagues in France were major influences in the 1950s and 1960s for understanding the historical patterns of economic growth (Lyons et al. 2008; Van Der Wee 2007). In Australia these developments helped shape the ‘orthodox’ approach to economic history particularly characterised by the greater use of statistics, the more explicit application of economic theory, and increased reference to national income accounting techniques (Lloyd 1995, 2015; Schedvin 1979). Central to the development of this orthodoxy was Noel Butlin, Professor of Economic History at the Australian National University (hereafter ANU), with the publication of his two seminal works (1962, 1964) representing the most decisive change from the older approach. His work emerged partly through dissatisfaction with the methodology and interpretation of earlier scholars, particularly the apparent neglect of domestic and urban sources of economic growth.

The 1950s and 1960s also witnessed a major institutional expansion. As in many developed nations, there was considerable higher education reform, with an increase in the number of institutions and students (Anderson and Eaton 1982; Forsyth 2014; Marginson 2000). Student numbers grew through government returned servicemen schemes, greater professionalisation of occupations, higher rates of participation in secondary education, and the growing perception that a university education was necessary for social and economic advancement (Anderson and Eaton 1982; Forsyth

2014; Marginson 2000). This increased the demands on existing institutions, and in 1957 the Murray report recommended the establishment of a number of new universities (Murray et al. 1957). The 1950s and 1960s were the 'golden era' of expansion for higher education. Butlin's innovative work was facilitated by generous appointments and research funding at the newly established ANU (est. 1946). He inspired other Australian work in a similar vein, and attracted scholars to the field in record numbers (Schedvin 1979; Sinclair 1987).

Though Butlin's framework dominated, particularly at the ANU in Canberra, there were other successful approaches within the field that were supported by national higher education expansion, and abundant research and teaching opportunities within the social sciences in the 1950s, 1960s and 1970s. Intellectual differences in the new thinking were based on location, highlighting the importance of spatial proximity between members of the field. A broad tradition of intellectual inquiry existed in Melbourne, integrating more with the history discipline and engaging with comparative perspectives, urban history and business history. In particular, John McCarty and his colleagues at Monash University and the University of Melbourne were inspired by the Canadian staples approach and transdisciplinary *Annales* School (Wright and Ville forthcoming). In Sydney, economic history research also concentrated on urban themes, banking history and political economy approaches. The field was more closely tied to economics in Adelaide both institutionally and through a greater integration with the US approach to the subject, which emphasised economic theory, hypothesis-testing, and statistical modelling to analysing issues in economic history (Coats 1980; Lyons et al. 2008). These geographic differences in approach highlight the plurality of this field. Each approach had its own thought leaders and intellectual 'successes' and this, supported by an expansionary higher education system, fuelled the maturation of this IDRF.

With a new intellectual movement supported by resources, undergraduate enrolments and graduate research programs blossomed, separate departments of economic history sprouted up and new professors bestrode university campuses. Graduate training in the 1950s was mostly under Butlin's supervision at ANU with smaller numbers trained at universities in Sydney and Melbourne. This reinforced the intellectual and professional links between members of the field, with PhD students maintaining connections to their supervisors through collaboration and ongoing university appointments. Throughout the 1960s the number of endowed chairs and separate departments of economic history grew from 3 to 10 (Pincus and Snooks 1988). This mirrored the expansion of the field internationally, with Britain experiencing a similar growth of endowed chairs and departments of economic and social history in the 1950s and 1960s (Hudson 2001). In the US, there was similar growth of university appointments, though separate departments never emerged – instead economic historians remained within economics (Lyons et al. 2008).

The intellectual and institutional expansion of economic history within universities was reinforced by a number of extra-university structures, with a specialised journal from 1956, and a society and conference from about 1970 (Morgan and Shanahan 2010; Pincus and Snooks 1988; Wright and Ville forthcoming). This lagged the development of similar structures overseas, with the German journal *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* established in 1903, the French *Revue d'histoire économique et sociale* in 1913, Britain formed their economic history society and journal in 1926 and 1927 respectively, the US economic historians commenced the *Journal of Economic History* in 1941, and the *Scandinavian Economic History Review* began in 1953. The formalisation of such structures for Australia's economic history community was thus part of a much larger worldwide trend. The journal began life in 1956 as the *Bulletin of the Business Archives Council of Australia*, before changing name and broadening its scope to *Business Archives and History* in 1962, and the *Australian Economic History Review* (*AEHR*) in 1967 (Morgan and Shanahan 2010). John McCarty and Boris Schedvin, both from Melbourne, edited the journal throughout these changes in the 1960s, under the watchful eye of Syd Butlin at the University of Sydney (Noel Butlin's older brother, and another very prominent economic historian). McCarty and Schedvin forged the academic character of the journal, encouraging a healthy mixture of approaches from more general historical discussions, to traditional accounts of the development of industries, through to more quantitative approaches concerned with the overall sources of growth (Morgan and Shanahan 2010; Pincus and Snooks 1988, 4).

The Economic History Society of Australia and New Zealand (EHSANZ) was formed in about 1970, running annual (or so) conferences, and taking over the ownership and editorship of the journal from 1974 (Pincus and Snooks 1988). Not much is known about the nature of the society or the conferences at this time, though in a series of interviews members of the field have since argued that the society was valuable for "co-ordinating the activities of the field in its growth phase" (Wright and Ville forthcoming). The journal, the society and the conferences had two functions. The first was to bring members of the field together, supporting the expansion of the field within universities and somewhat mediating the enclaves that resulted from geographic proximity. Secondly, they provided an opportunity for members of the field to communicate and integrate knowledge with scholars from adjacent disciplines. They were thus a key part of the communicating infrastructure for this IDRF. There is evidence that this was particularly successful within the journal, with articles in the 1960s and 1970s containing a diverse range of disciplinary allegiances, topics and methodologies.

The Australian economic history field in the 1950s, 1960s and 1970s is therefore characterised by a pattern of growth similar to that of an intellectual movement (as outlined by Frickel and Gross 2005). A general dissatisfaction (particularly from Butlin) with older approaches and interpretations prompted scholars to formulate a distinctive research agenda. General higher education expansion in Australia allowed scholars to harness resources to increase the numbers of graduate students, appointments and separate departments of economic history. These institutional developments combined with the journal, the society and the conference to provide a platform from which scholars could recruit new adherents to the approach. This greater intellectual and professional organisation meant that the "sparse field of disconnected solitaries and mavericks was transformed into a fraternity, one that was structured around key figures and filled out with associates and research students" (Coleman 2015, 21).

However, as this case study involves an IDRF, some dynamics were different from those outlined by Frickel and Gross. Most importantly, there was an intellectual plurality to the field, with several distinctive approaches each containing intellectual leaders and recruiting new members. These different groupings reflected the geographic proximity and the prevalence of separate departments of economic history. These small departments cultivated dense interactions among scholars, while those in the same city fostered a somewhat common approach. These different approaches were each an equally valid component of economic history, and had a distinctive relationship with the field's parent disciplines. It was the presence of extra-university structures that allowed members of the field nationwide to develop professional interactions, and some sense of shared identity and purpose. The journal, in particular, allowed members of the field to communicate amongst themselves, and integrate knowledge with those in economics or history.

4.2 Growing insularity

Though this mediation worked relatively successfully in the 1960s and the 1970s, over time institutional separateness conquered, and the economic history field became increasingly insular. Although departments of economic history facilitated the development of stable institutional structures that are a key aim of intellectual movements, cutting economic history off from its parent disciplines was an inappropriate move for this IDRF. The effect of this isolation was quite substantial in some cases, with an academic culture of low institutional and geographic mobility meaning that throughout this period some scholars remained in the same department at the same university (with the same people) for 25 or 30 years. Each department was generally a separate entity within economics or business schools, with only limited initiatives for inter-departmental projects or communication. Members of the field at this time have since recalled only limited contact outside their immediate institutional sub-structure, arguing that this then decreased the "dynamism and intellectual complexity" of the field (Wright and Ville forthcoming).

Though economic historians largely operated within separate departments, these were generally embedded within larger economics and business faculties. As a result, contact was maintained to some degree with economists, while at the same time severing economic history from humanities faculties and those in the history discipline. This institutional pattern was reflected in research programs, with economic history on the whole more closely resembling mainstream economics through a more explicit use of economic theory and an emphasis on advanced statistical techniques. The journal published a greater proportion of articles that used econometric methods, and the main collaborative works – Maddock and McLean's edited *Australia in the Long Run* (1987), Gregory and Butlin's edited *Recovery from the Depression* (1988), and Nicholas' edited *Convict Workers* (1988) – were all built around a strict economist's framework. This was generally incompatible with the theories and methods used in history while, at the same time, the history discipline's interest was moving further away from the analysis of economic change over time to a greater emphasis on cultural history (Teo and White 2003). Overall, separate departments of economic history meant the field came to more closely resemble the economics discipline, whilst being largely removed from the history discipline.

While those in economics generally approved of these efforts, by more closely resembling one of their 'parents', the economic history field had less differentiation, and thus less to offer the economics discipline. If economic historians had been appointed within economics departments, this may have resulted in the field being *re-absorbed* into the economics discipline, as was the case at a key university in the US (Mitch 2011). However, by being in a separate institutional form, but intellectually similar to economics, economic history was more or less ignored by the larger discipline. Compounded with their distance from scholars in history, throughout the 1980s members of the field became concerned that economic history was increasingly catering to a small, niche group (Pincus and Snooks 1988, 5).

By pursuing a more disciplinary pattern of growth, this IDRF neglected its broad intellectual and institutional communicating infrastructures. This is because the very forces that lead to the success of an intellectual movement are those that cause the field to transform into a stable institutionalized form (Frickel and Gross 2005, 208). The presence of intellectual leaders, academic departments, paradigmatic contributions, conferences and journals are the 'mechanisms of control' with which scholars maintain a set of accepted approaches in an intellectual community (Kuhn [1962] 1970; Whitley 1984). These conditions are necessary for the establishment of *disciplines*, but it severely restricts the communication and integration functions of the IDRF. The benefits of IDR – increased innovation, integrated knowledge, and the ability to tackle complex problems – are only realised when there is a coalescence of knowledge from different areas (Klein 1996a). By developing inward-looking communicating infrastructures that cut economic history off from its neighbouring disciplines, the field at this time sacrificed the innovative benefits of occupying the interdisciplinary space.

Although Australia's economic history field adopted many of the structures associated with a mature discipline, it also failed to develop as a distinctive domain of knowledge. This was partly due to lack of scale – economic history departments had always been small, with more limited student numbers (particularly beyond the first year level) compared to larger disciplines in humanities and the social sciences. The other, more inevitable, factor here was that economic history – even as simply as in name – is inherently dependent on the knowledge and methodological frameworks of its 'parent' disciplines (Cipolla 1991). This can be a source of strength and innovation, as we have seen previously when the field adequately fostered its communication and integration functions. However, this dependence suggests that the field may be unlikely to be intellectually distinctive enough to develop as a separate, specialised domain of knowledge.

4.3 Decline and reintegration

In the 1990s, these intellectual and institutional challenges were compounded by substantial changes to the external environment - higher education policy. In the late 1980s, the Minister for Employment, Education and Training under the Hawke Labor government, John Dawkins, introduced changes to the higher education system that are now referred to as the Dawkins reforms. After a period of consultation with the sector, Dawkins recommended the introduction of income-contingent loans for tuition costs (the Higher Education Contribution Scheme (HECS)), the conversion of Colleges of Advanced Education (which provided vocational, tertiary qualifications) into universities, the amalgamation of many of these with existing universities in each city, the encouragement of 'strong' research evaluation, and the allocation of competitive research funding based on the 'national interest' (Forsyth 2014; Marginson and Considine 2000; Woelert and Millar 2013).

These reforms were mostly carried out between 1987 and 1989, and the new, corporatized, demand-based structure for universities was partially responsible for the "institutional reversal of the fortunes of economic history in Australia" (Morgan and Shanahan 2010, 220). In the face of these funding pressures, and to facilitate economies of scale, smaller departments of economic history were either closed or merged with economics or management schools. With this loss of visibility economic history was also largely removed as a compulsory subject within economics or commerce degrees, decisions over which absorbed economic history groups had little control. The result was reduced numbers of students, fewer chairs and permanent appointments, and lower membership of the EHSANZ (Nicholas 1997).

Shifts in national research policy from the 1990s also adversely affected economic history. The main administering body, the Australian Research Council (ARC), was given much greater funding powers under the Dawkins reforms, with a substantial proportion of resources removed directly from university budgets and given to the ARC to allocate on a competitive basis (Forsyth 2014). Research evaluation was formalised with regular national assessment exercises of all university research beginning with the *Research Quality Framework* in 2004 and then the *Excellence for Research in Australia* initiative from 2010. Applying Whitley's (2007) classification of research evaluation systems (RES), Australia's regime has been 'strong' since this time because it has been standardised, transparent, regular and consequential. Developments in Australia's RES was part of a larger global trend for increased formal evaluation of university research (see various examples in Whitley 2007). However, although it has been similar to the 'strong' RES found in Britain, it stands in contrast to the 'weaker', less formal and consequential RES in Continental Europe (Whitley 2007). As seen in section 2, strong RES tends to inadvertently disincentivise IDR because it relies upon standard disciplinary measures of evaluation, and assessment from members of disciplinary 'tribes' (Gläser and Laudel 2007; Woelert and Millar 2013).

The establishment of competitive funding and regular evaluation required the development of criteria with which to define different domains of knowledge. In 1993, the Australian Bureau of Statistics released the Australian Standard Research Classification. This framework included various measures with which research activities could be evaluated including the 'Field of Research' (FoR) codes that categorise activities based on their disciplinary affiliations. Although FoR classifications have expanded significantly since their establishment, there are still no categories that effectively address the interdisciplinary space (Woelert and Millar 2013). Further, the codes have been plagued with 'problems of fit', with interdisciplinary research, even within a semi-permanent IDRF, resisting uniform classification. The result for economic history was that research and grant applications were assessed against others within the same ‘code’, meaning against work in economics or in history. As work from within a disciplinary ‘tribe’ tends to receive much higher citations, economic history was structurally disadvantaged in these situations.

Overall, the internal, intellectual challenges from the 1980s were amplified by changes to the external environment. The Dawkins reforms in the 1990s led to institutional amalgamations and a funding emphasis on what were essentially disciplinary measures of success. These internal and external factors together resulted in the dispersal of scholars, students and resources in Australia’s economic history community. This was consistent with the ‘death’ of the intellectual movement, as outlined by Frickel and Gross, with these changes to the field resulting in what can only be called panic within the reflective literature (see the special edition of the *AEHR*, November 1997).

The irony is that the institutional agglomeration of Australia’s economic history field provided an opportunity for the field to ‘subvert’ economics and to reintegrate with other disciplines (Lloyd 1997). Moving forward, the *AEHR* identified a need to appeal to a wider readership, and the community was urged to integrate with other branches of the social sciences (Lloyd 1997; Pincus and Snooks 1988; Whitwell 1997). “Intellectual broadening” was advocated to ensure the survival of the field, with innovative and integrated course instruction and research necessary to re-establish economic history’s relevance (Lloyd 1997, 264). The community at this time thus emphasised the need for the field to re-occupy the interdisciplinary space particularly between economics and history.

4.4 Re-invigoration

Frickel and Gross’s model of the development of intellectual movements sees no future for a discipline that has experienced an institutional decline. However, we propose that for IDRFs, such an institutional decline can be therapeutic by releasing the field from disciplinary constraints and allowing it to return to *le vide*. For Australian economic history, the closure and merger of separate departments provided the opportunity for the field to build bridges across disciplinary divides and again conduct interdisciplinary research – the temple doors were once more thrown wide open. The weakening of the connections among economic historians exposed members to a range of disciplinary approaches and knowledge, and facilitated the integration of knowledge across disciplines. In other words, far from enduring a speciality or insular stage of development and falling into disciplinary ossification, it reinvented itself as a genuinely IDRF.

There has been renewed interest in economic history from within both the economics and history disciplines. Within history, intellectual trends are suggestive of a shift away from the cultural turn of history of the 1990s. As one prominent historian recently noted, "historians are examining the economy once again" (Lipartito 2016, 101). At the same time, an impact of the Global Financial Crisis of 2007-8 has been to make economics more receptive to interdisciplinary overtures from economic history. It has served as a catalyst everywhere for the re-emergence of economic history's contribution to broad contemporary debate (Gittins 2011; Pettis 2010; Reinhart and Rogoff 2009). Institutional reflection of the closer association of economics and history has been evidenced in the establishment of the Joint Centre for History and Economics at Harvard and Cambridge (UK) Universities and various course programs in economics and history (Harvard University 2016).

These global influences have worked alongside the domestic changes described above to cause economic history in Australia to re-engage with, and rebalance the contributions of, each of its parent disciplines. In doing so, economic history is slowly reverting to its traditional role as an IDRF. Its communicating infrastructures have begun to turn outwards again. Its recent principal projects have brought together authors from both economics and history, and at the same time it appears to be achieving renewed recognition from these disciplinary partners (see diverse contributors in Bashford and Macintyre 2013; Ville and Withers 2015). Its journal and its annual conference have supported this shift to building closer links to other disciplines. A reflective quantitative assessment of its publications by the *AEHR* on its fiftieth anniversary in 2010 confirms that in recent years there has been a greater diversity of publishing practices, not only a breadth of topics but more co-authorship across the institutional and geographic divide facilitated by the growing importance of electronic communication to scholarly collaboration (Morgan and Shanahan 2010).

Within the global economic history community, there has been recent advocacy of a framework more inclusive of both parent disciplines, in particular the previously neglected perspectives and methodologies from history and the humanities (Boldizzoni 2011; Lyons, Cain and Williamson 2008). A number of important epistemic advances have been fostered by economic historians at home and abroad that re-open the field to its IDRF role. In each case this has involved integrated and innovative knowledge, methods, or measurement that draw upon the renewed interdisciplinary connections. The emerging history of capitalism literature, beginning in the USA, has been indicative of renewed connections between history, political economy, and economic history (Harvard University 2011). The Great Divergence debate, triggered by Pomeranz's 2000 book of this name, has engaged wide-ranging debate and discussion about the timing and reasons for the divergence in rates of economic development between Europe and Asia over the last two to three centuries. Historians have particularly engaged with this important development, providing alternative measurements to some standard economic measures of wellbeing such as GDP. Others, taking a more economics-based perspective, have extended the use of their preferred measures and theories including new historical measurements of the terms of trade (see a review of this debate in Ville 2015). McLean's important study of Australia, *Why Australia Prospered* (2013), has contributed to this debate by setting the nation's historical experience against suitable nations such as Argentina using a range of economist's tools of theory and measurement combined with the insights from historians about the distribution of power in colonial Australia. The recently published *Cambridge Economic History of Australia* (Ville and Withers 2015), the first comprehensive study of Australia's economic history for three decades, brought together economists applying development theory and macroeconomic policy with historians working on topics such as urbanisation. Economic history has formed the focal point for several approaches to the study of the history of firms, mediating between the historian's interest in the history of capitalism and the management history approach espoused by economists and management scientists. In Australia this has led to important advances that make use of both approaches such as in the study of cartels and competition policy (Round and Shanahan 2012). Research into the historical experience of water regulation including the allocation of water rights is part of Australian economic history's recent engagement with questions central to the study of environmental economics and policy (Harris 2007; Harris 2013).

5. Conclusions

We have seen that there often exists a mismatch between words and action in research policy, with the benefits of interdisciplinary approaches frequently extolled but with disciplinary practices more commonly adopted. We share the view of the recent literature that argues that rather than competing modes of knowledge production, disciplinary and interdisciplinary research is complementary. Disciplines provide expertise and intellectual foundations, while IDR is able to integrate this knowledge in innovative ways. While IDR can exist in a number of different forms, we focus on the agency of the semi-permanent interdisciplinary research field. These fields are not passing allusions, nor mere momentary flashes of creativity, instead they involve various communicating infrastructures that are able to bring together disciplinary scholars, and facilitate the communication and integration of knowledge between them.

To demonstrate the development of IDRFs over time, we use the case study of Australia's economic history field. From a series of isolated scholars, this field developed in the post-WWII period to have sustained institutional autonomy, distinctive intellectual traditions, and a number of extra-university structures that fostered both the identity of the group and communication between larger disciplines. Over time these structures fostered inward-looking communication, which resulted in a narrowing intellectual approach, and isolation from their disciplinary partners. Changes to higher education policy in the 1990s altered this trajectory by dispersing some scholars and resources, but forcing those who remained to look outwards. Though the focus on 'strong' research evaluation remains a challenge for the field, overall these developments have been therapeutic. Recent evidence suggests a shift towards a broader and more integrative approach to economic history in Australia, with this IDRF once again occupying the interdisciplinary space. We conclude that some disciplinary structures limit the ability of the IDRF to act as the bridge between disciplines. Instead, its agency is best realised through communicating infrastructures that are flexible enough to allow scholars to communicate and integrate knowledge from different disciplines.

We welcome other studies of the lifecycle development of semi-permanent interdisciplinary research fields, which we believe may include tourism (principally integrating management and marketing), organisational behaviour (anthropology, psychology), cultural studies (sociology and literature), and international studies (politics, economics). We also note that there are other broader forms of interdisciplinary groupings that may have more well defined discipline-like qualities. These would tend to more enduring than our semi-permanent IRDFs and therefore fall outside the scope of this paper, but would benefit from further research.

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