

Arranged Marriage: Mergers as Industrial Policy in Britain, 1966–70*

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Abstract

How does competition affect innovation and firm performance? In the 1960s, the British government pursued an experiment in merger-led industrial policy through the Industrial Reorganisation Corporation (IRC). Archival evidence shows policymakers embraced a “Schumpeterian” belief that larger firms would be more innovative, and sought to accelerate industrial rationalization by promoting consolidation in strategically important and technologically advanced sectors. Crucially, IRC sponsorship conferred a regulatory privilege: backed mergers were insulated from scrutiny by the Monopolies and Mergers Commission, providing a guaranteed escape from investigation under the Monopolies and Mergers Act of 1965. Using firm-level quality-adjusted patent stocks, financial accounts, and daily stock-market data, I evaluate the effects of IRC-sponsored mergers on innovation, operating performance, and shareholder returns. The results show declining innovative output, no improvement in operating performance relative to peers, and short-run abnormal stock returns concentrated in targets. These findings indicate that government-backed consolidation primarily enabled firms to bypass competition law and entrench incumbent power, rather than fostering technological dynamism or productivity growth.

Keywords: competition, mergers, market structure, innovation, industrial policy, United Kingdom

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*Draft. This version reproduces the submitted thesis chapter; engagement with the broader literature appears elsewhere in the dissertation (particularly in the introduction) and will be integrated into the stand-alone article manuscript. Comments welcome; please do not circulate or cite without permission.

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3.

ARRANGED MARRIAGE: MERGERS AS INDUSTRIAL POLICY IN BRITAIN, 1966–70

The more it appeared that British industry was not growing as fast as its rivals ... the more Governments tended to favour ... larger, more powerful firms assisted by the Government in carrying out the necessary technological changes ...

- Aaronovitch and Sawyer (1975a)

These combinations embody a theory, now fashionable in the British government, which might be caricatured as follows: In order to achieve industrial efficiency, find the most efficient firm in Britain and merge the rest of them into it.

- Richard Caves (1968)

In the South Seas there is a Cargo Cult of people. During the war they saw airplanes land with lots of good materials, and they want the same thing to happen now. So they've arranged to make things like runways, to put fires along the sides of the runways, to make a wooden hut for a man to sit in, with two wooden pieces on his head like headphones and bars of bamboo sticking out like antennas—he's the controller—and they wait for the airplanes to land. They're doing everything right. The form is perfect. It looks exactly the way it looked before. But it doesn't work. No airplanes land.

- Richard Feynman, Caltech Commencement Address, 1974

3.1 INTRODUCTION

In the decades after WWII, Britain's economic performance persistently lagged behind that of its peers (Kitson and Michie, 1996; Crafts, 1998; Pemberton, 2004), being overtaken in real GDP per capita and labour productivity rankings by nations like France and West Germany. Debating the causes of post-war relative economic decline became something of a national pastime among historians and economists, with a plethora of contributing factors suggested in the secondary literature. An influential view blames a lack of competitive pressure in domestic markets for undermining productivity growth, fostering managerial complacency and inhibiting innovation (Broadberry and Crafts, 2001; Crafts, 2012).

The idea of decline was also salient at the time (Tomlinson, 2001). One contemporary diagnosis of British economic problems—believed true by Prime Minister Harold Wilson—contended that industries remained too fragmented, and firms too sub-scale, to achieve optimal efficiency. His famous call for British industry to be ‘forged in the white heat of this [scientific] revolution’ embodied an optimism that the state could modernize British industry (Wilson, 1963).

Upon taking office in 1964, his government embraced an ambitious industrial policy where, rather than relying on market competition to weed out inefficient firms, the administration sought to forge national champions by engineering mergers among leading companies in key sectors. This approach reflected the belief that Britain needed larger, stronger firms to compete globally, unlock economies of scale, facilitate modern management, boost investment in research and development (R&D), and overcome years of under-performance under the rule of the Conservative party.

These contrasting diagnoses—insufficient competition versus insufficient scale—echo a classic dilemma in the field of industrial organization: does market concentration and/or firm size spur or stifle innovation and performance? Ever since Schumpeter’s work, economists have taken seriously the hypothesis that large firms with market power can better finance R&D and drive technological progress, while others counter that monopoly “slack” under-

mines efficiency and that vigorous competition is needed to spur innovation (Schumpeter, 1947; Hicks, 1935).

Which force dominates is ultimately an empirical question. Lazonick (2002, p. 3) points out that, '[t]he social conditions affecting innovation change over time and vary across productive activities; hence ... analysis ... must be integrated with historical study.' 1960s Britain provides a critical historical test case.

A centrepiece of Labour's modernization agenda was the creation of the Industrial Reorganisation Corporation (IRC) in 1966, a state-sponsored body, formally established as a statutory corporation by an Act of Parliament (Industrial Reorganisation Corporation Act 1966), charged with promoting and financing mergers to rationalize industry.

The IRC White Paper specifically highlighted a 'need for more concentration and rationalisation to promote the greater efficiency and international competitiveness of British industry' (HM Government, 1966, § 2). It stated that, 'the typical company in Britain is too small to ... take advantage of economies of scale; to undertake effective research and development ... to install the most modern equipment or to attract the best qualified management' (*ibid.*, § 3).

Justifying direct intervention, the White Paper stated there was, 'no evidence that we can rely on market forces alone to produce the necessary structural changes at the pace required' (*ibid.*, § 4). Backed by the IRC's resources and political support, a wave of consolidations reshaped major manufacturing sectors in the late 1960s. High-profile examples included the formation of British Leyland and the takeover of several electrical engineering firms by Arnold Weinstock's General Electric Company, moves explicitly intended to create "world-class" enterprises in those industries.

At this time, competition policy had been recently strengthened by the Monopolies and Mergers Act 1965, which gave the Monopolies Commission the power to prevent mergers for the first time. However, the Commission's work took a back seat to the pro-growth industrial policy in this period, with the Wilson government willing to relax scrutiny of mergers on competition grounds in order to facilitate structural change.

The IRC White Paper acknowledged the new policy would result in, 'mergers which come within the scope of the Monopolies and Mergers Act,' but promised firms they, 'can be cer-

tain ... that the resulting mergers will not be referred to the Monopolies Commission' (HM Government, 1966, § 11). Not only was no IRC-sponsored merger ever investigated by the Monopolies Commission, but merger deals which had previously been blocked by the Commission were later endorsed and completed under the IRC.

Did this merger-led industrial policy succeed in improving firm performance and innovative activity? This is the central question of this chapter. I apply several quasi-experimental event study designs to estimate how IRC-sponsored mergers affected firm performance. To do this, I bring together firm-level panel data on patenting activity, financial accounts, and share prices. Multiple analytical approaches are employed here in recognition of the diverse objectives associated with the IRC's interventions. Particular emphasis is placed on innovative performance, given its centrality in policy debates and the absence of systematic evaluation in the existing literature.¹

Three main findings emerge. First, innovation declines after IRC-sponsored mergers. Interrupted time-series estimates show a significant deterioration in quality-adjusted patent stocks relative to pre-merger trajectories. Second, there is no evidence that mergers improved operating profitability: across multiple performance indicators, post-merger outcomes of IRC firms broadly tracked those of comparable firms, rather than diverging positively. Third, the stock market reacted favourably at the time of announcement (mirroring policy optimism), with cumulative abnormal returns concentrated in target firms and in cases without explicit government financing. Together, these results reveal a general lack of success to the IRC's interventions, given their stated objectives, as well as a sharp contrast between contemporaneous market optimism and longer-run innovative and operating outcomes.

Important criteria for judging the IRC fall outside the scope of this analysis. Regional employment is one such dimension: although not written into the Corporation's remit and not enforced through merger undertakings (Hills, 1981, p. 74), the employment consequences of restructuring were politically salient. The balance of payments is another. Government concern with external performance was acute in the 1960s, yet any attempt to link individual mergers to trade outcomes falls short on the absence of disaggregated data and the difficulty

¹As Hindley and Richardson (1983, p. 139) noted, assessing the IRC's effect on 'technical developments, and the value of any impact, are extremely hard to gauge.'

of isolating causal effects. Future work might fruitfully explore these or other dimensions, but my emphasis is on indicators that align directly with the IRC's stated objectives as well as core themes in industrial and competition policy—market structure, competition, and innovation.

This chapter contributes to three strands of scholarship. First, it adds a quantitative, outcome-based perspective to the historiography of Britain's post-war industrial policy; previous work on the IRC has either been qualitative in nature (Beesley and White, 1973; Hills, 1981; Hague and Wilkinson, 2018; Gandy and Edwards, 2019), selecting particular firms or sectors as case studies, or has focussed on a single dimension of firm outcomes, such as long-term stock market performance in Hindley and Richardson (1983).

Secondly, it provides new firm-level evidence on the relationship between merger-led industrial consolidation, innovation, and performance, speaking to long-standing debates in industrial organization over whether scale or competition is the stronger spur to dynamism. Finally, it offers historical evidence on the perennial policy dilemma of how governments balance industrial strategy with competition policy, a dilemma that has resurged in current debates on concentration, innovation, and national champions.

The remainder of the paper is structured as follows. Section 2 provides institutional background on the IRC. Section 3 describes the data sources and empirical methodology. Section 4 presents results on innovation, operating performance, and market reactions. Section 5 concludes.

3.2 HISTORICAL CONTEXT

Intellectual Foundations of the IRC

Keynes (1936) wrote that, ‘Practical men ... are usually the slaves of some defunct economist ... distilling their frenzy from some academic scribbler of a few years back.’ The two economists which were arguably most influential to the Wilson government’s thinking around market structure are Joseph Schumpeter and John Kenneth Galbraith. While it may seem odd to suggest these two are aligned, when it comes to their writing on competition, market structure, and innovation some shared ideas emerge. Both perceive a kind of fallacy of composition in

orthodox theories of competition; where because an oligopolistic firm may be “inefficient” compared to a perfectly competitive firm, it is assumed the same can be said of their broader industries. Both strongly emphasize the role of technical innovation in the firm as a counterexample to this way of thinking, and argue that large, oligopolistic firms are better able to realize said innovations.

Schumpeter’s work is recognized as one of the first fully-fledged theoretical contributions to the economics of innovation (Scotchmer, 2004). In Schumpeter (1947, ch. 7), where he outlines his view of capitalism as an evolutionary process and method of economic change, he derides an ‘entirely imaginary golden age of perfect competition’ and states that improvements in popular living standards ‘evolved during the period of relatively unfettered “big business.”’ Innovation—in the form of the ‘new consumer goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates’—is the fundamental element in this evolutionary process; and it is implied that the typical oligopolistic should (or must) be tolerated because it may be superior in realizing such innovations compared to an industry which is “more competitive” based on a static, snapshot analysis:

A system—any system, economic or other—that at every given point of time fully utilizes its possibilities to the best advantage may yet in the long run be inferior to a system that does so at no given point of time, because the latter’s failure to do so may be a condition for the level or speed of long-run performance.

Similar sentiments are expressed in Galbraith (1952, 1967). In Galbraith (1952, p. 86), he calls the ‘modern industry of a few large firms [as] an excellent instrument for inducing technical change’ and very forcefully claims that future innovation can only come from large industrial concerns:

There is no more pleasant fiction than that technical change is the product of the matchless ingenuity of the small man forced by competition to employ his wits to better his neighbor. Unhappily, it is a fiction. Technical development has long since become the preserve of the scientist and the engineer. Most of the cheap and simple inventions have, to put it bluntly and unconvincingly, been made. Not only is development now sophisticated and costly but it must be on a sufficient scale so that successes and failures will in some measure average out. Few can afford it if they must expect all projects to payoff.

These views on the relation between size and technical change are reiterated in Galbraith (1967)—the main argument of which is that in the capital-intensive core of the modern economy, the competitive market has been displaced by a corporate ‘planning system’ run by a ‘technostructure’, where prices are administered, entry is limited, demand is shaped by marketing and advertising, and innovation is routinized inside large firms—where it is stated that the, ‘small competitive firm cannot afford the outlays that innovation demands.’ (p.40).

Because the oligopolies that characterize this economy aren’t reliably disciplined by atomistic rivalry, constraint must come from organized countervailing power: labour, large buyers, and the state, rather than shareholders. The policy corollary, congenial to Wilson’s project, is to steer industry and help influence broader socio-economic objectives:

If the society sets high store by technological virtuosity and measures its success by its capacity for rapid technical advance, this will become a goal of the corporation and therewith of those who comprise it. (Galbraith, 1967, pp. 201-2)

While the influence of Galbraith on Wilson’s policies (and general left-wing thought in post-war Britain) has been widely recognized (Thompson, 2010; 020, 2014, p. 385), that of Schumpeter has not. But Schumpeter was a tutor to Thomas Balogh, Wilson’s economic adviser, in Berlin, and provided letters of introduction for Balogh to Keynes, which were ‘instrumental in getting Balogh a successful start when he came to Britain in 1930’ (Morris, 2007, p. 10). Balogh’s views on international trade, highly relevant to the balance of payments problem in late-1960s Britain, were influenced by Schumpeter (Morris, 2007, p. 78), believing that trade advantages accrued to countries or companies with greater technical knowledge and greater rates of technical advance. The archival evidence on Balogh’s views, discussed below, suggest that other aspects of Schumpeter’s thinking also made a lasting impression.

It is irrelevant at this stage to consider whether a policy like the IRC is true to the spirit of the works cited above, or naturally follows from their arguments and conclusions. The important point, instead, is to understand the broader economic philosophy underlying the IRC policy and the archival evidence above. In the case of Schumpeter, for example, the points cited above are largely criticizing the *modus operandi* of contemporary economic theorists, creating

and wielding models of competition which were “valid” but perhaps not “true”,² rather than explicit policy prescriptions.³

Nonetheless, his (and Galbraith’s more explicitly prescriptive) views provided some intellectual justification for the Wilson government to pursue policies, like the IRC, which sought to maximize the dynamic efficiency of British industry through interventionist changes to the structure of the high-tech manufacturing sectors. Similar to Schumpeter own assessment of Keynes’ *General Theory*, where he states Keynes ‘seems to invite purely theoretical discussion’ from fellow economists, but says, ‘it is not quite easy to accept that invitation, for everywhere he really pleads for a definite policy, and on every page the ghost of that policy looks over the shoulder of the analyst’ (1936, p. 792)—it is hard to argue against a kind of policy relevance to Schumpeter’s writings on competition and market structure, whether they were properly applied or not.

At the time of the IRC, there also existed an extensive body of empirical literature on the relationships between market structure, firm size, and firm innovation or performance more broadly. While they tend not to focus on mergers specifically, they are nonetheless relevant given how mergers directly affect market structure and the dynamics of inter-firm rivalry. It is possible these also helped to legitimize the IRC programme. However, the assessment of Cohen and Levin (1989, p. 1089), writing in the late 1980s, rings true of the earlier literature also: that, ‘the empirical results concerning how firm size and market structure relate to innovation are perhaps most accurately described as fragile.’ This suggests that the support of pro-merger policy was based instead on theoretical presupposition and/or the intuition and personal views of important advisors and leaders within government departments.

Archival Evidence

This section discusses some of the archival records relating to the IRC, which support the claims of the preceding section around the intellectual foundations of the IRC. Hindley and

²‘The conclusions alluded to at the end of the preceding chapter are in fact almost completely false. Yet they follow from observations and theorems that are almost completely true.’

³Schumpeter was generally averse to advocating specific policy stances. For instance, in the preface of his *Business Cycles* (1939, p. vi), he writes: ‘I recommend no policy and propose no plan ... it will be seen ... that my analysis can in fact be used to derive practical conclusions of the most conservative as well as the most radical complexion.’ *Capitalism, Socialism, Democracy* was no different in this regard. As McCraw (2012, p. 197) notes: ‘For competition policy, it is the most relevant of all his works, but, again, it offers no explicit formulas.’

Richardson (1983, p. 126) say it is uncertain as to what basis the claims made in the White Paper could be reasonably made. The archival evidence reveals the figures behind these claims, and their justification for doing so. Additionally, this section seeks to justify a central contention of the chapter: that the IRC operated within, and helped to entrench, a governmental settlement in which orthodox competition policy was subordinated to merger-led industrial reorganisation.

The archival records reveal both the intellectual underpinnings of this settlement and its institutional practice. They show 1) sustained scepticism among ministers and advisers toward neoclassical models of competition; 2) a managerialist and scale-based philosophy of rationalization; and 3) repeated circumvention of Monopolies Commission oversight in favour of discretionary industrial judgement.

Before the IRC's creation, Thomas Balogh argued forcefully against what he called a 'philosophy of efficiency through greater competition' and in favour of *positive* merger-promotion powers for the Monopolies Commission (The National Archives: CAB 147/95, 67). In Balogh's view, inefficiency stemmed not from inadequate antitrust enforcement but from 'wrong firm size,' 'too short production runs,' excessive product variety, and a consequent 'lack of research and development.' Strengthened competition policy, he warned, would 'create the wrong atmosphere' and frustrate the efforts of the Department of Economic Affairs (DEA) and the Ministry of Technology to rationalize growth industries. Rationalization, he argued, required state-backed mergers—financed through bodies such as the Finance Corporation for Industry—and insulation of the new reorganization agency from the merger procedures of the 1965 competition Act (The National Archives: CAB 147/100, 66, Balogh to Lord Brown, 8 Dec. 1965).

This intellectual stance was echoed across Whitehall. Minutes of a Board of Trade meeting in October 1966 record a shared view that existing theoretical models of competition were 'too remote from the realities of everyday life' for policy design and that the competitive process was 'essentially a dynamic one,' influenced not only by market structure but also by the 'personality and motivation of the individual entrepreneur' (The National Archives: BT 213/407, 1966, *Research into Competition*, 12 Oct. 1966). The climate was thus receptive to

Schumpeterian arguments about dynamic efficiency and to a planning-based logic in which industrial structure would be deliberately engineered rather than discovered through rivalry.

The case for concentration was also articulated from within the Ministry of Technology (MinTech). In September 1965, Balogh forwarded to the Prime Minister a draft proposal from Cant (the “NATCORD” paper), which warned of the ‘urgent need for more purposeful concentrations and re-alignments of the Nation’s productive resources’ and the limited reliability of ‘existing market forces’ to achieve this within the time available for economic rehabilitation (The National Archives: CAB 147/100, 66, Balogh to D.J. Mitchell, 15 Sep. 1965). In parallel, Lord Brown and Elliott Jaques circulated *The Need for Concentration in British Industry* (14 Jan. 1965), arguing that Britain required ‘one or a few really large firms in each industry (an oligopoly)’ to compete with American, European, and Japanese corporations; the domestic ‘bogey of monopoly,’ they insisted, was misplaced because concentration brought ‘the bigger men with bigger minds,’ capable of longer planning horizons and organizational control.

A consistent theme in these files is the perceived scarcity of managerial talent. In August 1966 Balogh told the Prime Minister that Britain suffered from a ‘very great shortage of really good managers’ and that ‘mergers are mainly justified because they enable really able people to be used to the full and to be spread around more extensively’ (The National Archives: PREM 13/2363, 1968, 2 Aug. 1966). The managerial bottleneck justified rationalization not merely for economies of scale or standardisation of product lines, but to redeploy scarce talent.

Contemporary assessments of the IRC’s leadership reflected this ethos. Jock Campbell of Booker Bros. wrote privately to Balogh in December 1965 that Frank Kearton, who was to become head of the IRC, was ‘immensely able, thoroughly professional … with great—perhaps ruthless—willpower,’ respected if not always liked, and possessed of ‘positive and aggressive’ leadership—precisely the sort of technocratic authority thought necessary to make reorganization bite (The National Archives: CAB 147/100, 66, Campbell to Balogh, 23 Dec. 1965).

The logic was visible in practice in the IRC’s sponsorship of merger deals: the 1968 GEC/AEI combination, originally conceived by the IRC (Hills, 1981, p. 67), was seen as desirable largely because it placed Arnold Weinstock in command of the merged group (Hills, 1981, p. 70). At the same time, however, doubts that Weinstock’s emphasis on current returns discouraged

longer-run performance—whether he ‘sacrificed too much ‘honey tomorrow’ for ‘jam today’ (Hills, 1981, p. 70)—exposes the fragility of a “great man” managerial justification.

These managerial arguments dovetailed with scale calculations then circulating in policy circles. In evidence to the House of Commons Select Committee on Science and Technology, Patrick Blackett stressed that R&D outlays are largely fixed relative to eventual output and that the expensive downstream stages of development, production, and marketing account for the bulk of the ‘innovation chain.’ On his (illustrative) figures, a firm needed at least 500 employees and a turnover of £1 million to sustain even a small team of qualified scientists and engineers—pointing toward larger integrated units as the minimal organizational form for advanced industries (HC Select Committee on Science and Technology, Memorandum by Blackett).

If this was the intellectual case, the policy choreography around the IRC’s launch reveals the politics of embedding it. In January 1966, R.R.D. McIntosh advised that announcing the IRC alongside the new system of investment grants would blur its distinctiveness; the Corporation should be launched separately to ensure it registered as a novel structural instrument (TNA, CAB 147/102, McIntosh to Sir Eric Roll and Mr Burgh, 10 Jan. 1966). By May, MinTech’s sectoral priorities were being canvassed: heavy engineering drew debate, but electrical engineering was marked as of the ‘highest priority’—with a handwritten note cautioning that bringing steel within the IRC’s remit would likely meet objections (TNA, CAB 147/105, T.C. Cooper to Balogh, 26 May 1966). The Prime Minister’s own note of April 1966 made the institutional vision explicit: once an industry plan existed (via “little Neddies” or inquiries), execution would lie with production departments, and the IRC would be ‘one of the instruments, and perhaps a key instrument, through which changes in industrial structure will be effected’ (TNA, CAB 164/365, 26 Apr. 1966).

This settlement sat uneasily with the formal language of merger control. In June 1965, Douglas Jay, President of the Board of Trade, wrote to the Prime Minister to emphasize that the Monopolies and Mergers Bill was not intended to obstruct desirable mergers; many were ‘positively in the national interest,’ and the Bill merely empowered investigations where the public interest demanded it. Balogh responded within days, pressing for his contrary views

to be put directly before the Prime Minister (TNA, CAB 147/95; Jay to PM, 4 Jun. 1965; Balogh minute to P. Le Cheminant, 14 Jun. 1965). The exchange captures the tension which developed between Jay's desire for selective oversight as safeguard and Balogh's strategy of activist reorganization.

In practice, the balance tilted toward the latter. The English Electric–Elliott Automation merger (June 1967) is instructive. Michael Stewart hailed the deal as a 'very important development' for advanced technology without prior consultation with the BoT or the Monopolies Commission (The National Archives: EW 27/238, 67, Stewart to PM, 22 Jun. 1967). Jay protested that agreed procedures of early consultation had been ignored and warned that the Interdepartmental Mergers Panel was being forced to decide on 'quite inadequate information,' yet—reluctant to expose the breach of protocol—he agreed not to refer the case (The National Archives: EW 27/238, 67, Jay to Stewart, 22 Jun. 1967; Stewart to Jay, 23 Jun. 1967).

Treasury minister Harold Lever observed privately that the IRC had been pursuing MinTech policy and that it was 'too late to intervene' once the firms were committed (The National Archives: EW 27/238, 67, Cowling, Note for the Record, 28 Jun. 1967). An internal note reported that the IRC would 'probably claim very forcibly that their view of what makes industrial sense was more valid than that of civil servants' and that attempts to undo its work could prompt the Board's resignation en bloc (The National Archives: EW 27/238, 67, R.H.F. Croft, Confidential Note, 30 Jun. 1967). In public, *The Economist* pronounced that the merger 'has pleased everybody,' casting the IRC in a "catalytic" role (1 Jul. 1967, p. 41). The documentary record points instead to a pattern of *faits accomplis*: once the IRC had committed itself, scrutiny under the Monopolies and Mergers Act receded.

Treasury files from July 1967 confirm the Corporation's autonomy. Officials accepted that, by the nature of its operations, the IRC would extend finance on terms unavailable in ordinary markets but emphasized that it should seek compensating safeguards (e.g. equity options). Criticism of 'soft loans' was judged presentational rather than substantive. Crucially, Sir Frank Kearton insisted that no standing instructions could bind the Corporation: if ministers were dissatisfied, they should use their statutory powers to remove the Board rather

than circumscribe its discretion (The National Archives: EW 27/238, 67, A. Currall, "IRC," 11 Jul. 1967).

The broader policy conversation linked this structural strategy to macroeconomic anxieties. In October 1967, T. Swain (MinTech) cited Michael Shanks's *The Innovators* to argue that a decade of 'stop-go' had deterred investment in capital-intensive sectors—steel, chemicals, automobiles—undermining realized returns and hence reinvestment; stronger structural instruments were needed to anchor long-term productivity (The National Archives: CAB 164/365, 1968, Swain to Thornton, 9 Oct. 1967). In this frame, the IRC was not an anomaly alongside competition policy but part of a coordinated attempt to overcome short-termism in British industry through concentrated, better-managed firms.

All in all, these archival sources support the claim that the Wilson government's merger-led industrial strategy subordinated competition policy in both doctrine and practice. Balogh's critique of 'trust-busting,' Brown and Jaques's advocacy of concentration, Blackett's scale calculations, and the managerialist emphasis on scarce talent furnished the intellectual rationale. The launch strategy (McIntosh), sectoral prioritisation (Cooper), and the Prime Minister's designation of the IRC as a 'key instrument' established the institutional path. In execution, ministers tolerated procedural breaches (English Electric–Elliott) and accepted IRC autonomy (Currall/Kearton), even at the cost of side-lining the Monopolies Commission. Not satisfied to independently coexist alongside the Monopolies Commission, the IRC instead acted to redefine its boundaries and priorities, placing planned reorganization and managerial concentration above the discipline of competitive rivalry.

Hindley and Richardson (1983, p. 136) suggested that for some firms IRC sponsorship primarily provided a means to circumvent the monopolies and mergers legislation. Several IRC-sponsored firms had had proposed mergers investigated and/or rejected by the Board of Trade in the short time between the passage of the 1965 competition Act and the creation of the IRC (Board of Trade, 1967), and in one case, a blocked merger between two firms was later endorsed and completed under the IRC's auspices.

This case concerned Ross Group and Associated Fisheries (both involved in the catching of fish and the processing, and sale of fish food products), who, in May 1966, had a proposed

merger deal denied by the Board of Trade after the Monopolies Commission voiced concerns that this would enable the firms to, ‘regulate supplies and prices in their own interests’ (Monopolies Commission, 1966, p. 34). Later, in April 1969, the IRC announced its endorsement of a merger between the two firms to create British United Trawlers, proud that the new firm would be the ‘largest trawler company in Western Europe’ (Industrial Reorganisation Corporation, 1970, p. 14). This is a clear example of the IRC’s role in the shift away from the regulation of domestic competition to the promotion of internationally competitive national champions, through an extraordinary experiment in merger-driven industrial policy.

The IRC in Action

The IRC was established by the Industrial Reorganisation Corporation Act. Section 2(1) of the Act granted the IRC broad functional authority ‘for the purpose of promoting industrial efficiency and profitability and assisting the economy,’ exercised along two tracks: (a) promoting or assisting the reorganization or development of *an industry*; and (b) at a Minister’s specific request, providing assistance to *particular firms*. Operational powers included acquiring and disposing of shares, forming corporate bodies, making loans and guarantees, and supplying physical assets. The Act also provided a reserve power for the Secretary of State to issue general directions after consultation, but this was never used in practice.

From mid-1966 the IRC assembled its team and began sectoral reconnaissance. It operated with a deliberately small executive cadre recruited largely from the private sector, with roughly thirty staff in total. The Board comprised a Chairman and 7–14 members appointed by the Secretary of State (after consultation with the Chairman). Consistent with s.1(4) of the Act, members were required to have ‘wide experience of, and to have shown capacity in, industry, technology, commercial or financial matters, administration or the organisation of workers’ (Hague and Wilkinson, 2018). A Schedule set conflict-of-interest rules under which papers were withheld and members excluded from discussions where appropriate.

Early appointments included Sir Frank Kearton (Chairman) and Ronald Grierson (S. G. Warburg) as full-time Managing Director and Deputy Chairman; the initial part-time members were J. P. Berkin (Royal Dutch Shell), Bernard Boxall, Leslie Cannon (ETU), B. R. Cant

(of MinTech, whose NATCORD proposal paper was influential in the formation of the IRC), Sir Joseph Lockwood (EMI), Professor W.G. McClelland, Sir Frank Schon, Sir Donald Stokes (Leyland), and Sir Charles Wheeler (AEI) (Hague and Wilkinson, 2018, pp. 20–21).

The executive developed a standard project routine: intensive fact-finding and analysis by the responsible executive, frequent internal reviews, and Board-cleared action, with the Managing Director and Chairman personally handling key negotiations. In its own planning work, the IRC targeted sectors with rising import penetration, evident technological lag, and weak profitability, and sought to re-group firms into larger, “industrially logical” units (Hague and Wilkinson, 2018, pp. 236–37).

In day-to-day work, most projects proceeded under s.2(1)(a), with occasional s.2(1)(b) interventions where a specific ministerial request was needed. The Corporation typically brokered mergers, marshalled outside capital, and, only where necessary, committed its own funds on terms it deemed commercially defensible. Examples of financing provided from 1967–69 include support for the Leyland Motors–British Motor Holdings combination (with an IRC finance commitment up to £25 million), a £1.5 million facility for Reed’s de-inking plant, and loans or equity support in engineering and instruments (e.g., Whessoe; the George Kent/Cambridge Instruments merger).

The IRC’s finance comprised National Loan Fund borrowing and Public Dividend Capital (PDC), subject to an overall statutory ceiling of £150 million; by 1970 its total indebtedness stood near £107 million (about £64m NLF borrowing at rates between $7\frac{1}{2}$ and $9\frac{3}{4}$ per cent, and £43m PDC). The IRC prepared annual accounts and was required to lay them (and its report) before Parliament.

The IRC’s life was short. After the 1970 general election, the new government limited it to honouring existing commitments and legislated for termination (House of Commons, 1970, 1971), with ministers claiming significant budgetary savings from abolition. The IRC was neutralized by mid-1970 and abolished in April 1971. Even so, its dense burst of activity left a clear trail of sectoral reorganizations and records against which the empirical analysis in this chapter can be read.

3.3 DATA AND METHODS

This paper combines three complementary empirical strategies to assess the effects of the Industrial Reorganisation Corporation (IRC) on firm outcomes. First, I study innovation outcomes using a quality-adjusted patent stock built from firms' patents. Second, I analyse market perceptions using an event-study of cumulative abnormal returns in firms' share price around announcement of the IRC-sponsored merger. Third, I estimate profitability effects using difference-in-differences relative to industry peers who did not merge. This combined approach triangulates realized innovative output, investors' immediate valuation of mergers, and subsequent operating performance.

This design allows me to cover more facets of the IRC's impact than any single method, which is relevant given the multiplicity of goals ascribed to the IRC agenda. The resulting datasets for each part of the analysis have different but overlapping coverage, and any single one of the individual approaches taken in this chapter would necessarily mean excluding some IRC-sponsored firms (even without any idiosyncratic reasons for data missingness, which, in practice, inevitably occur). The relative coverage across the different analyses is displayed Figure 3.1.⁴ The complementary analyses are also conducive to a high level of data hygiene without fear of loss of generality (from, for example, having to exclude a significant firm or merger in any one strand of the analysis.)

Each subsection below describes the data and empirical strategy for each of the analyses. The common input for all analyses is the list of IRC-sponsored firms, compiled from the IRC's reports (Industrial Reorganisation Corporation, 1968, 1969, 1970, 1971). The IRC activities were then sorted into merger deals and non-merger initiatives (such as loans and other financing). A summary of all IRC projects is shown in Tables 3.6 and 3.7.

⁴The innovation analysis includes 67 unique firms across 46 mergers; operating performance analysis includes 53 unique firms across 23 mergers; the stock market response analysis includes 47 unique firms across 28 mergers.

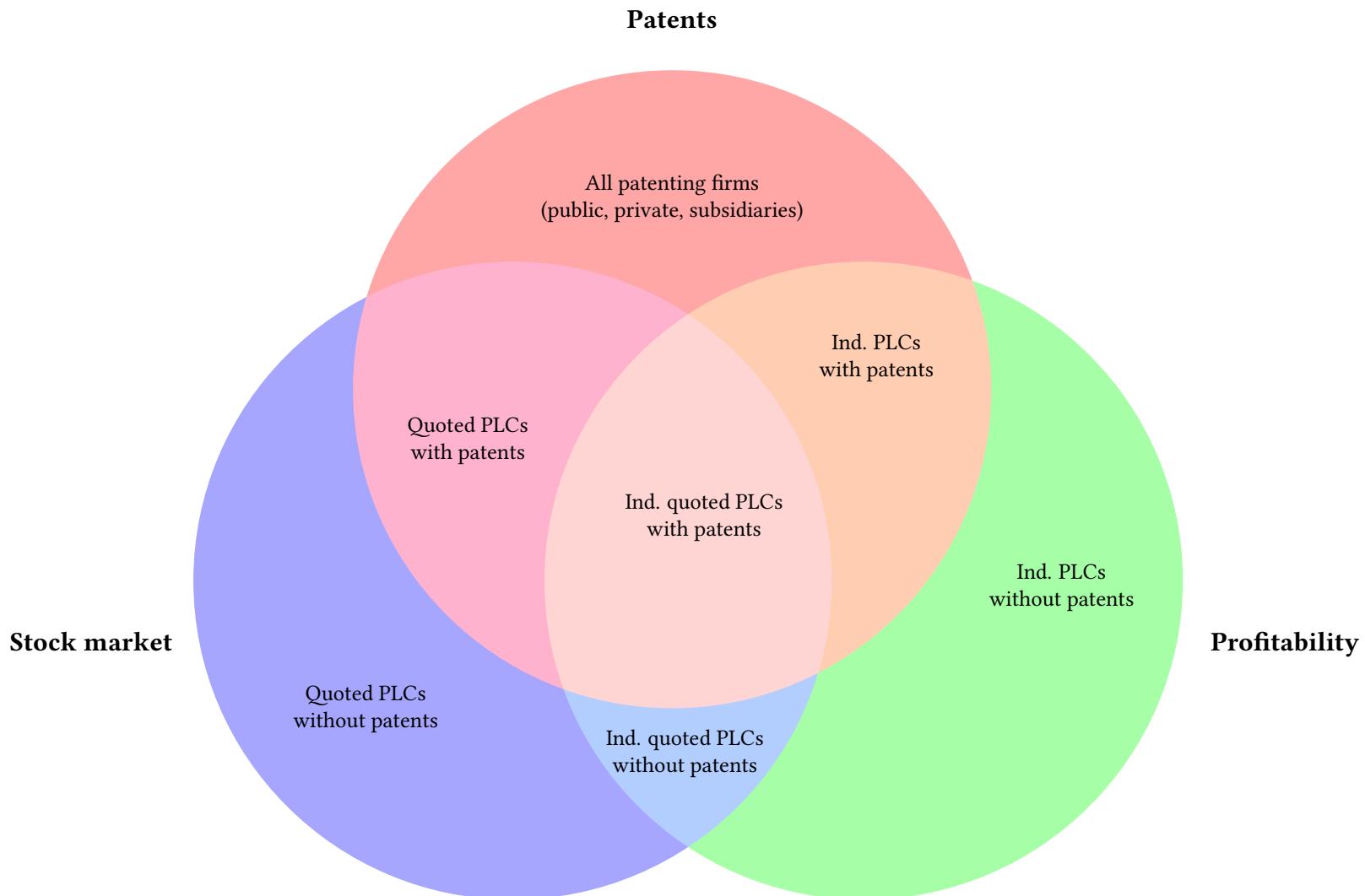


Figure 3.1: Coverage of firms across analyses: patents, stock market response, and profitability.

Notes: 'Ind.' means independent. 'PLC' means public limited company. 'Quoted' means listed on an official stock exchange.

3.3.1 INNOVATION

The innovative output of firms is proxied using quality-adjusted counts of patents granted.⁵ Data on patent counts or research and development spending form part of the science, technology, and innovation (STI) class of innovation metrics, which the economics literature frequently employs in empirical studies. Conceptually, these STI measures are rooted in what Laestadius (2003, p. 6) refers to as the ‘scientification of innovations’.

Patent data was collected from PATSTAT,⁶ extracted from European Patent Office databases, encompassing all British patents during the specified period.⁷ This data includes company names of patentees, patent titles and technical descriptions, jurisdictions of protection, the number of listed inventors and/or applicants per patent, and citation counts necessary for quality adjustment of basic patent counts.

Firm Matching Process

Using PATSTAT data, I compile a dictionary of firm-identifying phrases for IRC-sponsored firms found in patent abstracts, with each set linked to a firm identifier. Firm-identifying phrases were gathered through a manual search in the abstracts field of the PATSTAT data. This approach is required for two reasons. First, names referring to firms and their divisions in the applicant/inventor field (doc_std_name) or patent abstract field (app_ln_abstract) lack consistency. For instance, I identify patents held by Brightside Engineering Holdings using phrases such as:

- BRIGHTSIDE ENG (STAMCO) Ltd,
- BRIGHTSIDE FOUNDRY & ENGINEERING CO,
- BRIGHTSIDE FOUNDRY & ENG. CO,
- BRIGHTSIDE HEATING & ENGINEERING CO,

⁵I argued above that Schumpeterian ideas around innovation partly motivated the creation of the IRC and the relative authority given to it with respect to the Monopolies Commission. It is questionable to what extent patents capture the type of innovation which is associated with Schumpeter’s theories, however. He rarely discussed patents in his work (Guichardaz and Pénin, 2019) but, where he did, seemed to see them on balance as a ‘propelling and not an inhibiting factor,’ (Schumpeter, 1947, p. 88) and as part of a wider set of monopolistic practices. Machlup (1958) also claimed that Schumpeter was a proponent of patents.

⁶This section references specific fields in the PATSTAT Global dataset. For further information, consult a data catalogue or manual.

⁷I collect patents for the period 1950–75 for the analysis.

- BRIGHTSIDE HEATING & ENG. CO,

In order to minimize type I—for example, attributing a patent filed by the Leyland Paint and Varnish Co. to Leyland Motors—and type II errors—for example, missing many of The Weir Group’s patents attributed to the G. & J. Weir holding company prior to the group’s name change—in matching patents to firms as much as possible, manual inspection and verification is needed. In uncertain cases—such as, to give a simple example, confirming whether an entity with the letters ‘GKN’ in its name was part of Guest, Keen, and Nettlefolds—I used resources such as Grace’s Guide and newspaper archives for assistance (e.g. Graces Guide page for Floform.) Confirming matches in this way then led to additional phrases to search (to stick with the same example, I would then search for ‘Floform’ without the ‘GKN’ prefix.)

Secondly, the applicant/inventor field (doc_std_name) typically attributes credit solely to the individuals responsible for the invention, excluding the firm that employed them or held the rights to commercially exploit the patent. For instance, the patent illustrated in Figure 3.2. The doc_std_name field in the PATSTAT extract includes only the value

RICHARDSON LESLIE FREDERICK,

identified in the patent specification document as one of the inventors. But it is clear from the first line of the patent specification that it is Rolls Royce Ltd. who effectively owned the patent and planned to implement it in their engine designs. Regarding the data, only the app_ln_abstract field refers to Rolls Royce,⁸ where the relevant cell contains:

1,136,543. Gas turbine combustion chambers. ROLLS-ROYCE Ltd. ...

Firms can occasionally be identified from the doc_std_name field. However, when this occurs, identification is also possible via the app_ln_abstract field, but not vice versa. To prevent significant undercounting of firm-level patents, it is essential to systematically parse patent abstracts for firm-identifying phrases. This is achieved through a vectorized, case-insensitive search employing specific escaped regex characters.

⁸Rolls Royce were given a loan by the IRC in 1970 under Section 2(1)(b) of the IRC Act.

1,136,543



RESERVE CCPY

PATENT SPECIFICATION

DRAWINGS ATTACHED

1,136,543

Inventors: LESLIE FREDERICK RICHARDSON
and DAVID HARDING PARNELL

Date of filing Complete Specification: 20 Feb., 1967.

Application Date: 21 Feb., 1966.

No. 7527/66.

Complete Specification Published: 11 Dec., 1968.

© Crown Copyright 1968.

Index at acceptance:—F1 L1B1A

Int. Cl.:—F23 r 1/04

COMPLETE SPECIFICATION

Liquid Fuel Combustion Apparatus for Gas Turbine Engines

We, ROLLS-ROYCE LIMITED, a British Company, of Moor Lane, Derby, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to combustion apparatus for gas turbine engines, the apparatus being of the type in which liquid fuel being delivered to a combustion chamber is discharged in spray form for combustion in the chamber.

According to the present invention, combustion apparatus of the type described comprises a combustion chamber to enclose in use a combustion zone, and which has an upstream end wall apertured to provide an inlet for receiving air, a fuel supply which is also mounted at the inlet, a duct mounted within the chamber and extending from the said end wall, the duct having an inlet which receives the air and fuel vapourised from the supply, and having an outlet downstream of its inlet, through which outlet the duct discharges the air/fuel mixture for combustion within the chamber, there being a structure mounted at the outlet of the duct, which structure deflects the mixture to flow in a direction lying between the axial direction towards the end wall and the radial direction away from the duct outlet, the end wall having a shape to divide the discharged fluid upon its encounter with the end wall and produce flow thereof into first and second toroidal vortices, the first vortex being small and circulating along the end wall in the direction towards the duct, then downstream along the exterior surface of the duct, and then in the said deflected direction, the second vortex being substantially larger than the first, having a hand opposite to that of the first vortex and lying within the combustion zone of the chamber.

The chamber can be annular in form, in

which case the inlet and the duct are also annular, the swirl being about the axis of the annulus which can be the axis of the engine generally, and two small pilot vortices are then formed, which are toroidal about the same axis.

Alternatively, the chamber can be tubular, forming one of a ring of similar chambers mounted around the engine axis.

In this latter case the inlet and the duct of each chamber are symmetrical about the axis of the chamber, and the pilot vortex is toroidal about the same axis.

Preferably the apparatus further has a deflector having a nose portion which projects upstream to be impinged upon by fuel discharged from the burner.

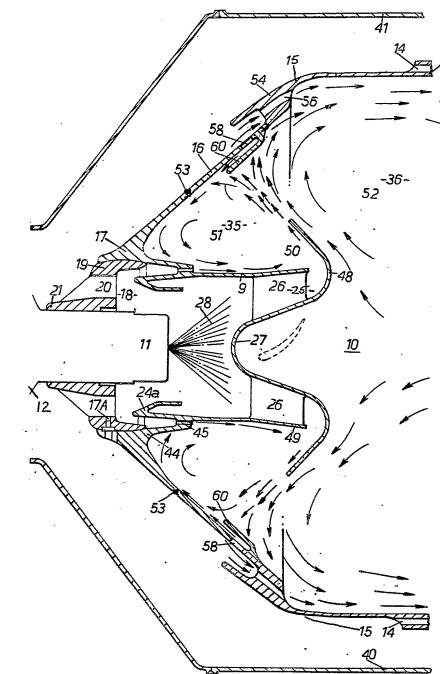
Preferably the deflector has an annular peripheral portion which curves upstream to overlap the outside of the duct and forms therewith an annular nozzle which discharges the mixture upstream with a radial outward component of motion.

A further preference is that vanes which support the deflector from the duct also serve as the means for imparting swirl to the mixture.

One apparatus according to this invention is described below with reference to the accompanying drawing which shows a longitudinal section through an upstream portion of a combustion chamber.

The description may in instances refer merely to a tubular or to an annular form of chamber, but this is to avoid repeated reference to the other form. It is to be understood that the drawing is diagrammatic in that it can be taken as either a total section through a portion of a tubular chamber, or else half of a section through a portion of an annular chamber, the plane of the section in each case including the axis of the chamber. To avoid confusion, many vertical outlines have been omitted from the drawing.

1136543 COMPLETE SPECIFICATION
1 SHEET
This drawing is a reproduction of the Original on a reduced scale



(a) Left: patent specification cover page

(b) Right: accompanying drawing

Figure 3.2: Example of Patent Application Documents (Rolls-Royce, GB1136543, taken from Espacenet)

For each phrase associated with a given serialno (used to identify firms across datasets), I extract patents whose abstracts contain that phrase. To avoid cases where different phrases for the same firm may hit the same patent, I de-duplicate at the level of appln_id (i.e. the patent identifier) before tallying. The result is a count of matched patents for each firm, summarized as $F_{i,t} = \sum 1\{\text{appln_id}\}$ by serialno = i and application year (or month) $t \in [1950, 1975]$.⁹ I also keep the forward-citation totals at the same level of aggregation, $C_{i,t} = \sum \text{nb_citing_docdb_fam}$, for quality adjustment of the raw patent counts.

At this stage, a basic description of the patenting activities of the IRC-sponsored firms is possible. 84.6% of merging firms in the sample were assigned at least one patent over the period 1950–75. The mean (median) number of firm patents over the period was 78.2 (11), and the mean (median) number of forward citations on a patent was 2.4 (1). The number of forward citations ranges between zero—which is the case for 3120 patents (40%)—and 139. The most cited patent in the sample belonged to British Insulated Callender’s Cables, a publicly traded cable manufacturer and construction company, and the firm which patented with the highest frequency (with 1,115 patents) was The General Electric Company, a leading electrical and electronics conglomerate.

Quality-Adjustment of Patent Stocks

A central concern in the empirical study of innovation is that STI indicators, such as raw patent counts, provide an imperfect measure of innovative activity. Firstly, not all commercially valuable or significant innovations are patented, and firms can rely on alternative mechanisms to prevent imitation (Moser, 2006). Secondly, patents vary widely in their technological and economic significance: many are never cited, while a small number receive substantial attention and underpin important technological trajectories. The common approach to this problem is to construct citation-weighted or otherwise quality-adjusted measures of patenting to gauge the economic value of firm innovative output more accurately (Trajtenberg, 1990; Hall et al., 2005)

⁹Application date is used instead of publication date as this is the point where the invention underlying the patent, which embodies the type of innovative output I am interested in, can be said to be completed. Only patents which went on to get published were included.

To address this, I construct a quality-adjusted patent stock for each firm-year (or firm-month) observation. The idea is to combine the flow of new patents with an adjustment for their expected impact, proxied by forward citations. In addition, the stock of past patents depreciates over time, reflecting both obsolescence of technologies and the finite duration of patent protection. This is known as a perpetual inventory method of tracking a firm's "knowledge stock" (Park and Park, 2006).

Let c_p denote the forward citations received by patent p . To make weights comparable across the sample and to retain a positive contribution for zero-citation patents, I rescale citations by the sample mean and add a unit baseline:

$$w_p = 1 + \frac{c_p}{\bar{c}}, \quad \bar{c} \equiv \frac{1}{N} \sum_{p=1}^N c_p.$$

Thus a patent with average citations ($c_p = \bar{c}$) receives weight $w_p = 2$, more highly cited patents receive proportionally larger weights, and non-cited patents receive $w_p = 1$. The mean-normalisation ensures that the scale of w_p is governed by the empirical distribution of citations in the sample, while the added unit preserves a strictly positive weight for low-impact patents.

The stock is initialized at the start of the construction window using a steady-state perpetual-inventory assumption. For each firm, I compute the average annual quality-adjusted patent flow over 1950–1960 (inclusive), $\bar{P}_{i,1950-1960}$, and set the beginning-of-sample stock to:

$$Q_{i,t_0-1} = \frac{\bar{P}_{i,1950-1960}}{\delta}, \quad t_0 = 1950,$$

which is the stock implied by a constant pre-sample flow and depreciation rate δ .¹⁰ The series is then built forward using the recursion described below.

The quality-adjusted patent flow for firm i in period t is defined as:

$$\tilde{P}_{it} = \sum_{p \in \mathcal{P}_{it}} w_p,$$

¹⁰It is not necessary to define an alternative initial stock for the monthly analysis, since the purpose of this stage is simply to gauge firms' existing patent stocks in the pre-analysis period.

where \mathcal{P}_{it} is the set of patents (applications) attributed to firm i in year t .

The quality-adjusted stock accumulates past flows subject to geometric depreciation:

$$Q_{it} = (1 - \delta) Q_{i,t-1} + \tilde{P}_{it},$$

where δ is the annual depreciation rate, from which a monthly depreciation rate δ_m can be derived using $\delta_m = 1 - (1 - \delta)^{1/12}$, and \tilde{P}_{it} is the set of patents applied for by firm i in period t , as defined above. Following common practice, I set $\delta = 0.15$ (i.e. a 15% depreciation rate) at the annual frequency, which has been widely used in the literature on R&D capital and knowledge stocks (Griliches, 1990), and results in $\delta_m \approx 0.0135$.

This approach incorporates two essential features. First, it counts each patent as contributing at least one unit to the stock, including those without citations. Such patents indicate that a firm is generating innovative output with perceived commercial viability, necessitating their inclusion as a measure of innovative effort, regardless of their ultimate value. Second, the methodology amplifies patents with higher citation counts, positing that these represent more significant inventions with greater economic value. For instance, a firm with fewer but impactful patents will possess a larger quality-adjusted stock compared to a firm with numerous low-value patents. It is these high-commercial-value innovations which would have been vital for enhancing British firms' competitiveness in international markets, thus underscoring the importance of this quality dimension in the measure.

Summary Statistics

At this point there exists a data structure tailored to the empirical strategy i.e. a panel dataset of firm-year or firm-month quality-adjusted patent stocks for the period 1961–75 inclusive. The raw quality-adjusted stock distribution exhibits significant skewness (2.72) and heavy tails (kurtosis = 6.95). Post-log transformation, skewness decreases to 0.53 and kurtosis to -0.69, approximating normality. This is illustrated in Figure 3.3, where histogram bars depict observation distribution with an overlaid kernel density (red line).

Summary statistics for quality-adjusted patent stocks, both raw and log-transformed, are presented in Table 3.1. Centring all observations around the merger date and dividing the sam-

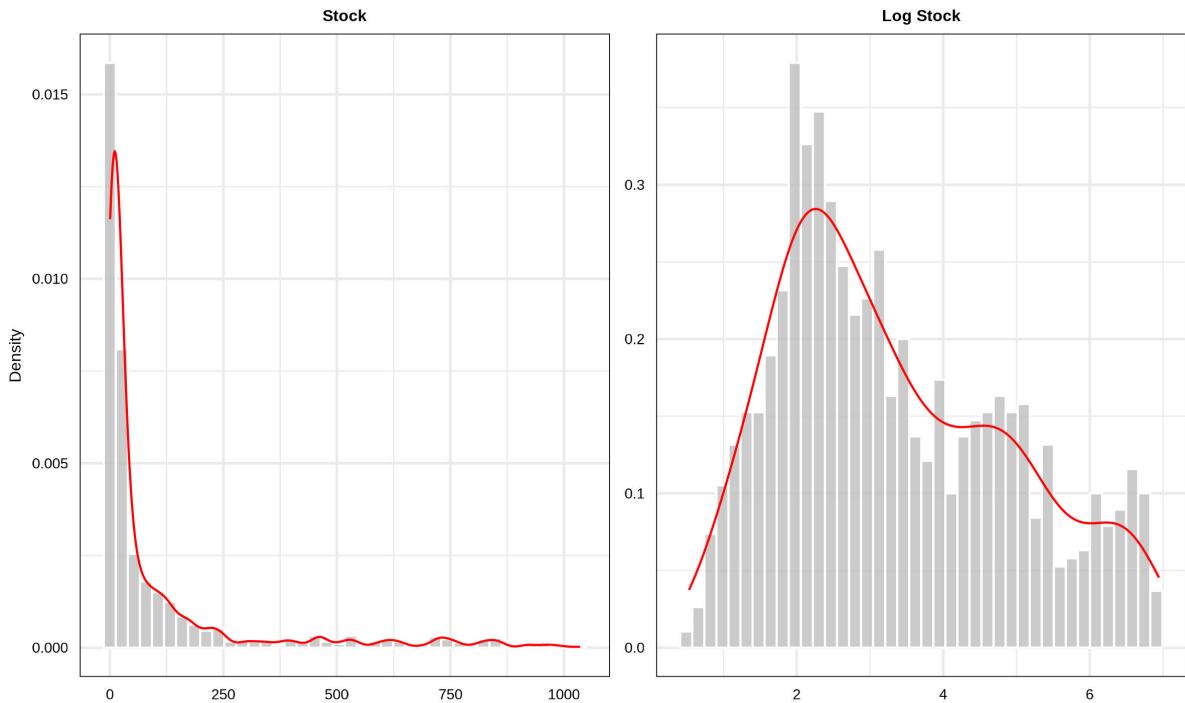


Figure 3.3: Distribution of quality-adjusted stock before and after log transformation

ple into pre- and post-merger periods reveals a decline in average raw and log-transformed quality-adjusted patent stocks post-merger. These raw post-merger declines are indicative; however, unconditional pre/post comparisons may conflate merger effects with underlying trends, common shocks, and compositional changes.

Empirical Strategy

To evaluate the impact of IRC-sponsored mergers on innovative activity, I utilize an Interrupted Time Series (ITS) approach (Bernal et al., 2017). The ITS framework is ideal for analyzing the effects of a discrete intervention occurring at a specific time, enabling an examination of potential changes in the level or trend of the outcome of interest. In this context, the "intervention" refers to the merger date, denoted by t , with the patent stock of the merged firm as the outcome. For clarity, I also create event-time plots that align firms by their merger year, illustrating the average patent stock in relation to this intervention.

A fundamental ITS specification can be formally expressed as:

$$Y_{it} = \alpha_i + \beta_1 time_t + \beta_2 post_t + \beta_3 (time_t \times post_t) + \varepsilon_{it},$$

Table 3.1: Summary Statistics, Quality-Adjusted Patent Stocks

| | Statistic | Stock | Log Stock |
|--------------------|-----------|---------|-----------|
| <i>Overall</i> | Mean | 101.619 | 3.335 |
| | SD | 192.762 | 1.579 |
| | p25 | 7.214 | 2.106 |
| | p75 | 92.124 | 4.534 |
| <i>Pre-merger</i> | Mean | 107.305 | 3.444 |
| | SD | 203.988 | 1.481 |
| | p25 | 8.514 | 2.253 |
| | p75 | 93.949 | 4.553 |
| <i>Post-merger</i> | Mean | 95.743 | 3.222 |
| | SD | 180.421 | 1.668 |
| | p25 | 4.926 | 1.779 |
| | p75 | 88.558 | 4.495 |

where Y_{it} represents the outcome for unit i at time t , α_i accounts for unit-specific effects, $time_t$ is a continuous variable indicating time relative to the merger, $post_t$ is an indicator that equals 1 in post-merger years and 0 otherwise, and $time_t \times post_t$ permits differences in post-merger and pre-merger trends. Thus, the coefficients β_2 and β_3 capture the changes in level and slope associated with the merger.

For each merger, I aggregate firm stocks within group-year cells to obtain $Q_{g,t}^{\text{tot}} = \sum_{i \in g} Q_{i,t}$. This creates a panel dataset that reflects the evolution of firms' quality-adjusted patent stock before and after the merger at the group level. This approach assumes that firms were effectively combined prior to the merger, allowing for the aggregation of individual patent stocks in both pre- and post-merger periods; a stylized visualization of this method is presented in Figure 3.4.

The event-time index in the figures is defined as event time = year/month - t , with event time = 0 representing the merger year or month. The ITS plots summarize the means and uncertainty bands of $Q_{g,t}^{\text{tot}}$ across groups aligned by event time.

To account for uncertainty in estimated mean paths, confidence intervals are derived through bootstrapping (Efron and Tibshirani, 1994). Bootstrapping involves resampling merged firms with replacement from the dataset, recalculating the mean patent stock by event time for each resample, and utilizing the empirical distribution of these means to create confidence intervals, which are illustrated in plots. I resample the merged groups with replacement

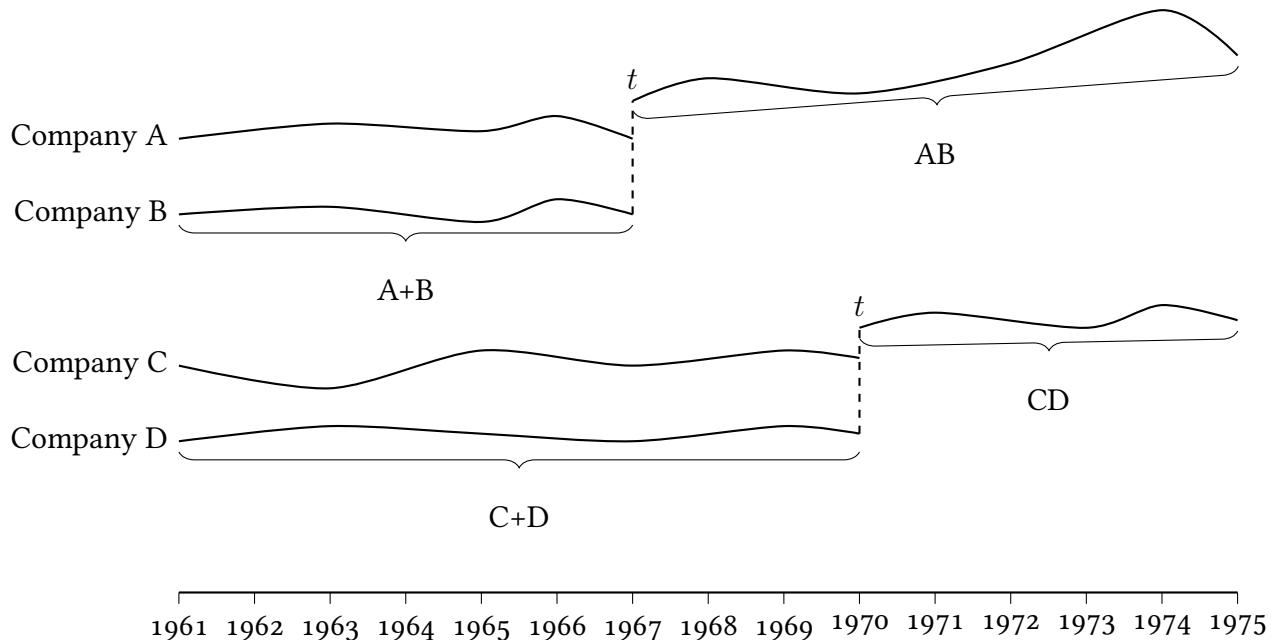


Figure 3.4: Stylized measurement of patent stocks around merger

$B (= 500)$ times, recompute the mean series for each resample, and extract the 2.5th and 97.5th percentiles of the bootstrap distribution at each event time to establish a 95% interval. These bootstrapped confidence bands illustrate the sensitivity of the estimated average trajectory to the inclusion or exclusion of specific mergers.

The bootstrapped intervals are non-parametric, requiring no strong assumptions about the data distribution. They effectively measure uncertainty, accounting for the limited sample of merging firms (due to the IRC's sponsorship of a finite number of mergers) and the heterogeneity in their innovative activity. These intervals are represented graphically as shaded bands surrounding the mean line in event-time plots. Narrow bands indicate greater precision in estimates, while wider bands signal increased uncertainty. The central mean line denotes the best estimate of the average pattern; the bootstrapped bands illustrate the range of plausible values derived from the data.

A limitation of the ITS approach is the absence of a control group. Consequently, an observed post-merger decline in patenting could indicate something like reversion to the mean rather than a genuine decline attributable to the merger's effects. This could occur if firms tend to merge following periods of above-average innovation, leading to subsequent slow-

downs independent of the merger. Nonetheless, employing firms outside the IRC-sponsored population as a control group presents inherent challenges.

Firstly, for rivals to IRC-sponsored firms in the same industry, who would be prime candidates for an external control group in an innovation analysis,¹¹ it is doubtful that these firms were left “untreated” by the interventions. Any assistance, whether financial or advisory, provided to IRC-sponsored firms likely disadvantaged other firms. As Hindley and Richardson (1983, p. 139) note, a key policy objective was to ‘take markets away from foreign rivals,’ which, if achieved, ‘must usually have done the same to domestic rivals’.

This issue is especially pronounced when innovation is the focus. According to Sutton’s Sutton (1991, 2001) sunk-cost theory of concentration, rising endogenous sunk costs, manifested as increased R&D expenditure, prompt rival firms to respond similarly to uphold their competitive positions. In line with Sutton’s theory, such escalation is anticipated in technical industries where R&D significantly influences market share. IRC-sponsored mergers—explicitly justified as permitting ‘economies of scale in … marketing and research’ (Industrial Reorganisation Corporation, 1968, p. 7), may drive competitors to enhance R&D efforts, engage in defensive patenting, or reorganize technical personnel. The “treatment” thus ripples outward, contaminating the innovation behaviour of would-be external controls.

Such rival responses would surely also affect outcomes for sponsored firms themselves. Increased R&D from rivals may compel sponsored firms to augment their innovative efforts. Consequently, the estimated treatment effect on innovation may be upward biased: we may observe stronger innovative output partly because rivals’ escalation forces sponsored firms to keep pace, creating a “virtuous cycle” of increasing innovative effort.¹²

¹¹Industry innovation dynamics differed sharply (Pavitt, 1984). Comparing, say, pharmaceuticals or electronics with textiles or cement would confound sectoral regime differences with treatment. A sensible external comparison would need to be within the same broad industry sector—but those closest rivals are exactly the units most exposed to IRC-induced spillovers.

¹²The dynamic is somewhat different when something like profitability is chosen as the outcome of interest. Rival responses could just as easily depress the margins of IRC-sponsored firms, regardless of whether the merger itself generated efficiencies or inefficiencies. If profitability falls following an IRC-sponsored merger, it is impossible to know (without a detailed case study) whether this reflects dis-synergies or mismanagement within the merged entity, or instead the pressure of intensified competition from rivals. In this sense, innovation outcomes, while not wholly immune from contamination, would provide a cleaner object of study: rivals’ responses are likely to bias estimated treatment effects in a predictable direction, whereas profitability outcomes are confounded in ways that cannot easily be separated econometrically.

The question also arises of how these other firms might have responded to a need to increase their own R&D efficiency and innovative output—possibly by pursuing their own mergers? Given that the primary focus is on the effects of mergers on innovative outcomes, this implies that these firms would not remain untreated once they merge. This is a relevant concern in IRC-affected industries, as creating a context which encouraged additional mergers was another explicit policy goal of intervention; as stated in the first report, ‘even a small merger, in an industry which has resisted structural changes, can influence the attitudes in the other companies in the field and thus break the log-jam which has held back rationalisation.’ (Industrial Reorganisation Corporation, 1968, p. 7).

Despite these concerns, the limitations of the ITS analysis motivates the use of a second, more explicitly causal approach in Appendix 3B as a robustness test. Although noisy, the results from these supplementary tests bolster the findings of the ITS analysis and confirm the general impact of IRC-sponsored mergers on innovative activity.

3.3.2 OPERATING PERFORMANCE

Given the diverse goals and objectives associated with the IRC’s interventions, several pertinent questions arise regarding the impact of IRC mergers on firms’ operational performance. Did profitability increase post-merger? Did merged firms invest more or experience faster growth? Were they financially more robust? Did they utilize assets more efficiently? What was the effect on exports? Due to data limitations, answering all these questions with precision is challenging. Nonetheless, I will attempt to touch on these aspects of the IRC’s impact in different ways.

Company Financials

The Cambridge-DTI dataset (Meeks et al., 1998) provides standardized financial accounts of quoted British firms from 1948 to 1990.¹³ Previous studies analyzing individual firm characteristics, as this research does, have varied in focus and Meeks (2017) describes some of these and

¹³The Cambridge-DTI dataset has its genesis in the 1948 Companies Act, which introduced detailed minimum requirements regarding the specific items that had to be disclosed in published company accounts and made consolidated accounts virtually compulsory for publicly traded firms. This made it possible to draw up a standard form to which most public firms’ accounts would conform.

their impact on various areas of British government policy. The dataset's significance lies in the economic impact of the firm population: in 1970, it constituted approximately 75% of the gross trading profits in the UK and contributed about 25% of GNP (Department of Industry, 1973; Central Statistical Office, 1972).

The dataset comprises individual firm-years, containing both biographical and quantitative financial data. A comprehensive list of the variables is presented in Table 3.9. To identify firms, unique serial numbers are created by concatenating their industry identifier with a DTI-allocated reference number, enabling identification within industries. This approach addresses inconsistencies in firm names across years for many entities. The data structure indicates that company numbers are intended for firm identification; firms appearing in another's financial statement are denoted by a standardized 7-digit combination of the firm's industry identifier, DTI reference number, and industrial subgroup identifier.¹⁴

To be included in the 1948 dataset, firms needed to meet specific criteria:

1. admission to the Official List of a UK stock exchange,
2. independent companies (i.e. not majority owned by another company),
3. operating primarily in the United Kingdom,
4. engaged principally in manufacturing, distribution, construction or transport, and certain other services (firms whose main activities were in agriculture, mining, shipping, insurance, property, banking, and finance were excluded)

These criteria imply that financial data for some IRC-sponsored firms, often private limited companies or subsidiaries of larger entities, is unavailable due to the absence of detailed intra-group accounts.

¹⁴There are important caveats to the firm reference numbers. Reclassification occurs when a firm's scope of activities changes, with data recorded under both the old and new industries from 1961 onwards; earlier reclassifications are forward-dated to 1961. Between 1958 and 1961, changes to the industry numbering system created duplicate identifiers: while firms generally retained their reference number, this caused conflicts when new industries were formed by combining old ones. In such cases, firm numbers were systematically altered to avoid duplication.

The raw dataset presents population truncation issues impacting the number of firms (Figure 3.5).¹⁵ I remove firms excluded for not meeting size requirements—coded as firm "deaths" in the data—along with those "dying" due to: industry elimination; falling outside the population scope (e.g., becoming primarily foreign); withdrawal by the DTI following non-quoted firm elimination; withdrawal due to insufficient accounts; or acquisition in a prior year without subsequent withdrawal until the year of death.

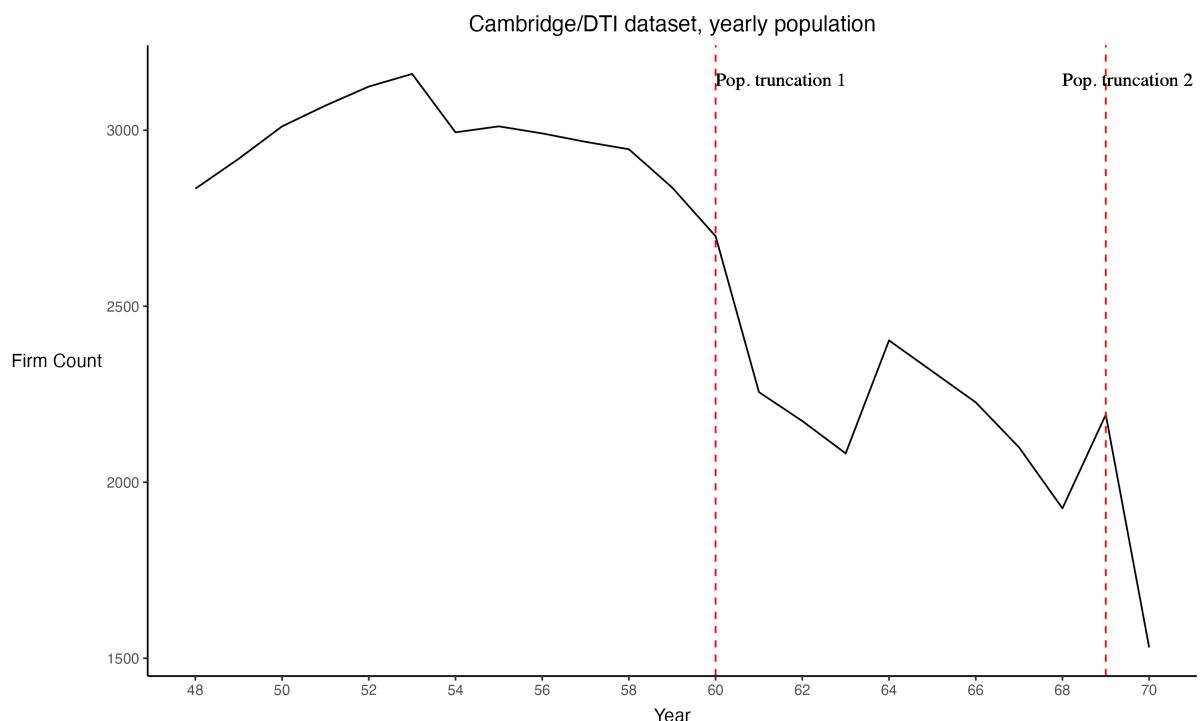


Figure 3.5: Effect of Population Truncation in the Cambridge-DTI Dataset

¹⁵From 1960, the DTI excluded firms with net assets below £0.5m and income below £50,000, reducing the sample from 2,699 to 2,256 firms (compared to roughly 3,000 in 1945–60). A stricter threshold introduced in 1969 (£2m assets or £200,000 income) cut the count from 2,192 to 1,531 in 1970.

Operating Performance Outcomes

Three financial ratios serve as outcome measures in this analysis: return on net assets (RONA), return on capital employed (ROCE), and return on equity (ROE). These ratios assess the efficiency of firms in converting resources into profits, in distinct manners, and have been used in previous work which assesses the performance of British manufacturing firms in this period (e.g. Higgins, 2003). Emphasizing production efficiency, I adopt RONA as the principal measure, omitting cash and non-operating financial investments from the denominator. ROCE and ROE are included as robustness checks, ensuring that consistent results across all three measures mitigate the influence of capital structure or accounting presentation.¹⁶

The ratios are computed using standard methods based on the Cambridge-DTI dataset variables:

$$\text{RONA}_{it} = \frac{\text{Net Income}}{\text{Net Assets}} = \frac{\text{var50}_{it} + \text{var51}_{it} + \text{var52}_{it} - \text{var53}_{it} - \text{var54}_{it}}{\text{var22}_{it}}$$

$$\text{ROCE}_{it} = \frac{\text{EBIT}}{\text{Capital Employed}} = \frac{\text{var50}_{it}}{\text{var60}_{it} + \text{var8}_{it}}$$

$$\text{ROE}_{it} = \frac{\text{Net Income}}{\text{Shareholder Equity}} = \frac{\text{var50}_{it} + \text{var51}_{it} + \text{var52}_{it} - \text{var53}_{it} - \text{var54}_{it}}{\text{var60}_{it}}$$

Profit measures like net income accrue throughout the financial year, while balance sheet items, such as net assets, are recorded at a specific point in time, typically year-end. Utilizing only the end-of-year value may introduce bias, especially when a firm's scale changes significantly during the period (e.g., due to growth, contraction, or mergers), as the stock variable may not accurately reflect available resources throughout the year. To align flow and stock measures, the financial ratio calculations are adjusted using the average of opening and closing balance sheet values in the denominator:

¹⁶RONA relates operating profit to the net operating asset base actually employed, so non-operating cash/investments should be excluded and goodwill treated consistently; ROCE uses operating profit over average capital employed (equity + long-term debt), abstracting from capital structure and interest; ROE is a shareholder-return metric that is mechanically sensitive to leverage, buybacks, and payout policy.

$$\text{RONA}_{it} = \frac{2 \times (\text{var50}_{it} + \text{var51}_{it} + \text{var52}_{it} - \text{var53}_{it} - \text{var54}_{it})}{\text{var22}_{it} + \text{var22}_{i,t-1}}$$

$$\text{ROCE}_{it} = \frac{2 \times \text{var50}_{it}}{(\text{var60}_{it} + \text{var60}_{i,t-1}) + (\text{var8}_{it} + \text{var8}_{i,t-1})}$$

$$\text{ROE}_{it} = \frac{2 \times (\text{var50}_{it} + \text{var51}_{it} + \text{var52}_{it} - \text{var53}_{it} - \text{var54}_{it})}{\text{var60}_{it} + \text{var60}_{i,t-1}}$$

Averaging opening and closing values yields a more accurate estimate of resources utilized in generating profits during the period, a practice long established in accounting and financial analysis (see, for example, Fridson and Alvarez 2022).

An additional outcome is the profitability ratio proposed by Meeks (1977) in his examination of UK merger outcomes, which has been frequently utilized in post-merger performance studies. The ratio relates pre-tax profit in year t to the average of net assets at the start and end of the year, thereby smoothing the denominator and reducing spurious volatility from year-to-year balance sheet changes. This measure is closer to an accounting return on assets but adjusted for timing, and it provides a natural benchmark for assessing whether mergers improved operating efficiency.

$$\begin{aligned}\text{Profitability}_{it} &= \frac{2 \times \text{Pre-tax Profit}_{it}}{\text{Net Assets}_{it} + \text{Net Assets}_{it-1}} \\ &= \frac{2 \times (\text{var66}_{it} - \text{var32}_{it} - \text{var33}_{it} - \text{var34}_{it} + \text{var59}_{it})}{\text{var22}_{it} + \text{var22}_{i,t-1}}\end{aligned}$$

Controls

I control for technological opportunity effects in each industry, specifically industry characteristics influencing innovation generation. I construct a binary variable HITECH equalling one for industries which Robson et al. (1988) classified as ‘core’ and ‘secondary’ sectors for innovation in the UK over the period 1945-83, which I match to firms in the DTI dataset based

on SIC codes.¹⁷ The data originate from a survey of 4,378 firm innovations, where industry and commerce experts identified significant technical innovations successfully commercialized in the UK since 1945. Core sectors contributed nearly two-thirds of innovations during this period (64.3%), while secondary sectors accounted for just over one-fifth (22.9%).

Empirical Strategy

To assess mergers' impact on firms' operating performance, I utilize a difference-in-differences framework with staggered treatment timing à la Callaway and Sant'Anna (2021). This approach is particularly well suited to the setting because mergers occurred in different years for different firms, and the Cambridge-DTI dataset includes an appropriate control group of firms that never merged. The method estimates group-time average treatment effects (ATTs) by comparing treated firms to never-treated controls in each period, then aggregates these estimates to construct dynamic event-time profiles around the merger year, which can be shown in plots for ease of interpretation.

The identifying assumption is that, in the absence of mergers, treated and control firms would exhibit parallel trends in operational performance. The Callaway–Sant'Anna estimator relaxes the stringent assumptions of two-way fixed effects models by accommodating staggered adoption and heterogeneous treatment effects. Additionally, I incorporate an anticipation window to exclude the year preceding the merger, thereby alleviating concerns regarding firms' performance adjustments in anticipation of merger approval.

The outcomes of interest are four ratios that measure firm efficiency in converting resources into earnings: the Meeks profitability ratio, RONA, ROCE, and ROE. Results for these outcomes are presented to evaluate robustness.

The resulting dynamic treatment effect estimates trace the trajectory of profitability, RONA, ROCE, and ROE from five years before to five years after merger. These event-study profiles provide evidence on both immediate and longer-run impacts of consolidation, and allow us to test whether performance improved in line with policymakers' expectations.

¹⁷Core sectors include chemicals, machinery, mechanical engineering, instruments, and electronics. Secondary sectors include metals, electrical engineering, shipbuilding/offshore engineering, vehicles, building materials, rubber and plastic goods.

For treated firms, I construct pre-merger composites that aggregate the performance of merging firms into a single unit in the pre-treatment period. This ensures consistency with the post-merger entity, avoids double-counting, and avoids biases arising from mechanical shifts in post-merger values of relevant variables as a result of absorbing target firms. These composites are then followed into the post-merger period. The control group is drawn from the DTI panel of firms that neither merged nor undertook significant acquisitions, and in some specifications is restricted to technologically comparable firms (based on the HITECH variable).

Additional Analysis

Because the data on key performance variables like exports and sales are only available from 1967 onwards, it is not possible to conduct even a simple pre- and post-merger analysis for these outcomes (never mind any more sophisticated, causal approaches). Nonetheless, I include some cross-sectional descriptive analysis for: export intensity, asset turnover, operating margins, employee-to-sales ratio, and total growth rate of net assets (incorporating both internal and external growth).¹⁸ The calculation for each variable is shown in Section 3C.

For each year from 1968 to 1975, I calculate the mean value of these indicators for two groups: 1) IRC-sponsored firms; 2) a comparison sample of firms from the wider Cambridge-DTI population, who were not involved in any mergers over this period. I also use a restricted version of this comparison sample group, which includes only those firms classified as HITECH = 1, which may represent a closer like-for-like comparison to IRC firms.

While recognising that these groups were not randomly assigned, and may differ systematically, this design at least teases out comparative trends in export performance and asset efficiency for IRC-sponsored firms, a broader population, and a more technologically advanced subset. The findings should be interpreted as, at best, suggestive of broader patterns rather than as definitive evidence of causal treatment effects.

¹⁸Internal growth is defined following Meeks (1977) as net new investment in fixed assets and acquisitions of net current assets. External growth reflects acquisitions of subsidiaries (for cash, share exchange, and by assuming subsidiary liabilities). The sum of the two yields the total growth of net assets.

3.3.3 STOCK MARKET RESPONSE

To gauge investors' immediate assessment of IRC-backed mergers, I study share price reactions in a $\{-1, +1\}$ window around the merger announcement. This analysis is modelled after classic short announcement-window event studies (Asquith, 1983; Dodd, 1980; Eckbo, 1983), which provide the most statistically reliable evidence on the perceived value creation of mergers (Andrade et al., 2001, p. 109) and avoid the conceptual and methodological concerns of long-run event studies (Fama, 1970, 1998).

The validity of the short-window event study rests on the assumption that equity markets adjust promptly and without systematic delay to the release of public information. If this holds, movements in share prices in the days surrounding a merger announcement can be interpreted as the market's assessment of the merger's expected impact on firm value.

Data Collection and Variable Calculation

Since the *London Share Price Database* (London Business School / Wharton Research Data Services, 2025) does not provide daily prices for listed stocks until 1984, daily share prices for firms merging under the IRC and market index values had to be hand-collected from historical issues of the *Financial Times* and *The Times*. An example of how the source data looks is provided in Figure 3.6. The sample includes any IRC-sponsored quoted public limited companies for which I observe prices and index values on at least two days in the window.

Where the exact date of concurrent merger announcement and IRC sponsorship within a month could not be worked out, mergers are excluded from the sample. The unit of observation is a firm-merger pair (i, j) identified by serialno (firm) and mergeid (merger). I retain two labels for heterogeneity analyses: type (acquirer vs. target) and finance (an indicator for IRC/government financing as part of merger sponsorship).

Share prices are quoted in the pre-decimal British currency format (£sd), which had to be converted to decimal values prior to analysis. This was calculated by: Share prices are quoted in the pre-decimal British currency format (£sd), which had to be converted to decimal values

prior to analysis. This was calculated by:

$$\text{Decimalized Price (in pounds)} = \text{Pounds} + \frac{\text{Shillings}}{20} + \frac{\text{Pence}}{240},$$

where 20 shillings equalled one pound, and 12 pence equalled one shilling (i.e., 240 pence equalled one pound).

The process of calculating returns is as follows: Let t_0 denote the announcement date for merger j . I compute a three-day announcement window $\{-1, 0, +1\}$ relative to t_0 (day -1 is the last trading day before the announcement). For firm i , let $P_{i,t}$ be the closing price on day t . The buy-and-hold return (BHR) over the window is:

$$R_i^{(3)} = \left(\frac{P_{i,0}}{P_{i,-1}} \right) \left(\frac{P_{i,+1}}{P_{i,0}} \right) - 1 = \frac{P_{i,+1}}{P_{i,-1}} - 1,$$

whenever the three prices are observed. If the middle day is missing, I use the two-day jump $R_i^{(3)} = P_{i,+1}/P_{i,-1} - 1$; any observations with fewer than two distinct prices in the window (due to, for example, unavailable issues of the *Financial Times*) are dropped.

Abnormal performance is measured relative to broad market indices (FT-30, FT-500, FT All-Share). For each index m with level I_t , I compute the corresponding market BHR over the same window,

$$R_m^{(3)} = \left(\frac{I_0}{I_{-1}} \right) \left(\frac{I_{+1}}{I_0} \right) - 1,$$

and define the cumulative abnormal return (CAR) for firm i as:

$$\text{CAR}_i^{(m)} = R_i^{(3)} - R_m^{(3)}.$$

Because the window is short, the simple market-adjusted CAR is standard and closely approximates market-model residuals (Brown and Warner, 1985; MacKinlay, 1997). Using three indices provides a robustness check that the sign and magnitude are not driven by a particular benchmark.

For a given benchmark m , I report the cross-sectional mean of $\text{CAR}_i^{(m)}$ and a two-sided t -test of $\mathbb{E}[\text{CAR}] = 0$ in the full sample and within subgroups (by variables finance and type).

Pre-Merger Anticipation

Hindley and Richardson (1983) are concerned about the anticipation of mergers, resulting in pre-announcement bidding, in their analysis. Their method is to take the number of shares in IRC-sponsored firm X which could be bought with £1 on 30 December 1966, shortly after the IRC Act received the Royal Assent, and to calculate the total shareholder return (i.e. capital appreciation and dividend payments) on this investment assuming all shares were held until 31 December 1979.

However, it seems this lengthy, uniform window around all mergers may induce greater costs to statistical validity than those coming from potential anticipation. The archival evidence above, showing that even government ministers were not aware of some IRC mergers until just before announcement, suggests very limited “leakage” of information about proposed mergers. Indeed, sticking with the example of the English Electric and Elliott merger, no archival newspaper records hosted by Gale Primary Sources contains any indication that the two would merge prior to the announcement date.

But it is not possible to guarantee this is not happening in other cases. The announcement of the finalized deal between George Kent and Cambridge Instruments, for example, was actually preceded by a bidding war for Cambridge between Kent and The Rank Organisation. This caused Cambridge’s share price to successively jump each time a new bid came in, in hope of a subsequently higher offer. In the end, it was the IRC’s preference for the firm to be wrapped up with Kent—and their willingness to put their money where their mouth is, with £6.5m in financing provided—that helped decide the final pairing.

If anything, this sort of pre-announcement anticipatory bidding suggests the three-day announcement window selected here would *understate* the cumulative abnormal returns generated.¹⁹ Overall, I expect there to have been leakage in the case of some mergers, none in

¹⁹In the case of positive excess returns, this means estimates can be taken as a lower bound which do not factor in pre-announcement share price movements. In the case of negative or no excess returns, the situation becomes more complicated, as it is not clear how much pre-announcement bidding offsets the observed share price movements (or lack thereof) during the announcement window under observation.

others, and, in cases where there was some leakage of information, do not believe this impairs the analysis.²⁰

The short-window approach taken here is superior in providing a clean period of analysis with no firm-specific confounding factors able to take place at the same time, while broader confounding factors are soaked up by the benchmark indices. Additional data collection is costly, and the evidence suggests that it yields little additional benefits: Andrade et al. (2001) find that expanding a three-day window around merger announcement to a longer period from 20 days prior to the point of merger completion produces results which are, ‘essentially identical’ but with ‘statistical precision [being] considerably *reduced* as the event window is lengthened’ (p. 110, emphasis added). Their data is for the period 1973–98, with subsamples for each decade (i.e. 1973–79 etc.)

By contrast, the very extensive time period used by Hindley and Richardson (1983) allows a plethora of factors to creep in and affect firms’ share prices. Their approach might be better suited to judging the IRC as a portfolio manager, in the relatively smaller subsample of cases where finance is provided to firms, rather than judging it from the general economic point of view.

3.4 RESULTS AND DISCUSSION

3.4.1 INNOVATION

Tables 3.2 and 3.3 report the results of the ITS regressions of patenting around merger events, at both an annual (Table 3.2) and monthly (Table 3.3) frequency of stock recalculation. The coefficients in these regressions can be interpreted as capturing the change in the trajectory of patenting stocks following a merger event. Before assessing the results, some further clarification is needed on design choices.

Using a monthly frequency for the analysis provides greater precision in identifying the timing of events. A yearly design assigns all mergers in a given calendar year to the same

²⁰For the difference-in-difference operating performance analysis I explicitly allowed for anticipation effects, yet here I dismiss this as a problem. The situations are different. Firm managers would clearly have much more knowledge about proposed mergers, and could therefore adjust behaviour, compared to external investors who merely have the choice to buy shares in the company.

event date, regardless of whether this occurred in, say, January or December. This can introduce potentially large mismeasurement in the treatment date. The monthly specification ensures that the event time aligns more closely with the actual timing of merger sponsorship and announcement, reducing attenuation bias in the estimated effects. This finer temporal resolution is particularly valuable in an ITS framework, where the dynamics of the pre- and post-merger trajectories are central to inference.

To focus on the dynamic response and to mitigate the strong skewness of raw patent stocks, as detailed above, the dependent variable is also expressed in logarithmic form. In addition, because mergers often take time to finalize and the effects on innovation may not be immediate, I estimate the monthly specifications using both the contemporaneous merger date (“immediate”) and an alternative event date lagged by twelve months. The latter serves as a robustness check, in effect being generous to merging firms by allowing for implementation lags before post-merger innovation behaviour is assessed.

It is for these reasons that Figures 3.7 and 3.8, included in the main text, are at the monthly frequency, using log-transformed dependent variables, and compare the immediate and alternative lagged event dates. Additional figures for all models are provided in Appendix 3B.

The results reveal a consistent pattern of declining patent stocks post-merger, with an accelerating rate of decline. The magnitudes implied by the monthly log specifications are substantial. Using the monthly ITS with logged patent stock, the estimates imply that five years (60 months) after a merger the expected patent stock of merging firms is about 52% lower than the counterfactual trajectory absent the merger.

The lagged specification yields a similar set of results: even when the event date is pushed forward by one year, the post-merger period is still associated with a significant and persistent reduction in the stock of patents. The fact that the downturn begins around the point of IRC sponsorship and merger announcement, and remains evident when allowing for lags, suggests that the negative effect is not an artefact of timing assumptions but a genuine feature of the data.

Overall, the ITS analysis indicates that mergers under the IRC were associated with a systematic decline in innovative output. From the vantage point of the IRC’s stated innovation

Table 3.2: Interrupted Time Series Regressions (Annual)

| Dependent Variables: Model: | Stock (1) | Log Stock (2) |
|--------------------------------|----------------------|------------------------|
| <i>Variables</i> | | |
| time | 6.929*** (1.855) | 0.0331** (0.0148) |
| post | -5.504 (6.947) | -0.0880* (0.0442) |
| time_after | -22.46*** (5.998) | -0.1440*** (0.0201) |
| <i>Fixed-effects</i> | | |
| merged_id | Yes | Yes |
| <i>Fit statistics</i> | | |
| Observations | 1,155 | 1,155 |
| R ² | 0.64203 | 0.74309 |
| Within R ² | 0.06017 | 0.07752 |

Clustered (merged_id) standard-errors in parentheses

Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table 3.3: Interruped Time Series Regressions (Monthly): Immediate vs Lagged Event Timing

| Dependent Variables: Model: | Stock (1) | Log Stock (2) | Lagged Stock (3) | Lagged Log Stock (4) |
|--------------------------------|-----------------------|------------------------|-----------------------|-------------------------|
| <i>Variables</i> | | | | |
| time | 0.4653*** (0.1353) | 0.0018 (0.0011) | 0.4117*** (0.1338) | 0.0014 (0.0010) |
| post | 1.240 (7.262) | -0.0163 (0.0356) | -12.80* (6.576) | -0.1102*** (0.0305) |
| time_after | -1.637*** (0.4487) | -0.0108*** (0.0016) | -1.618*** (0.4674) | -0.0104*** (0.0016) |
| <i>Fixed-effects</i> | | | | |
| merged_id | Yes | Yes | Yes | Yes |
| <i>Fit statistics</i> | | | | |
| Observations | 13,860 | 13,860 | 13,860 | 13,860 |
| R ² | 0.64960 | 0.74310 | 0.64947 | 0.74296 |
| Within R ² | 0.05095 | 0.07051 | 0.05060 | 0.07001 |

Clustered (merged_id) standard-errors in parentheses

Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

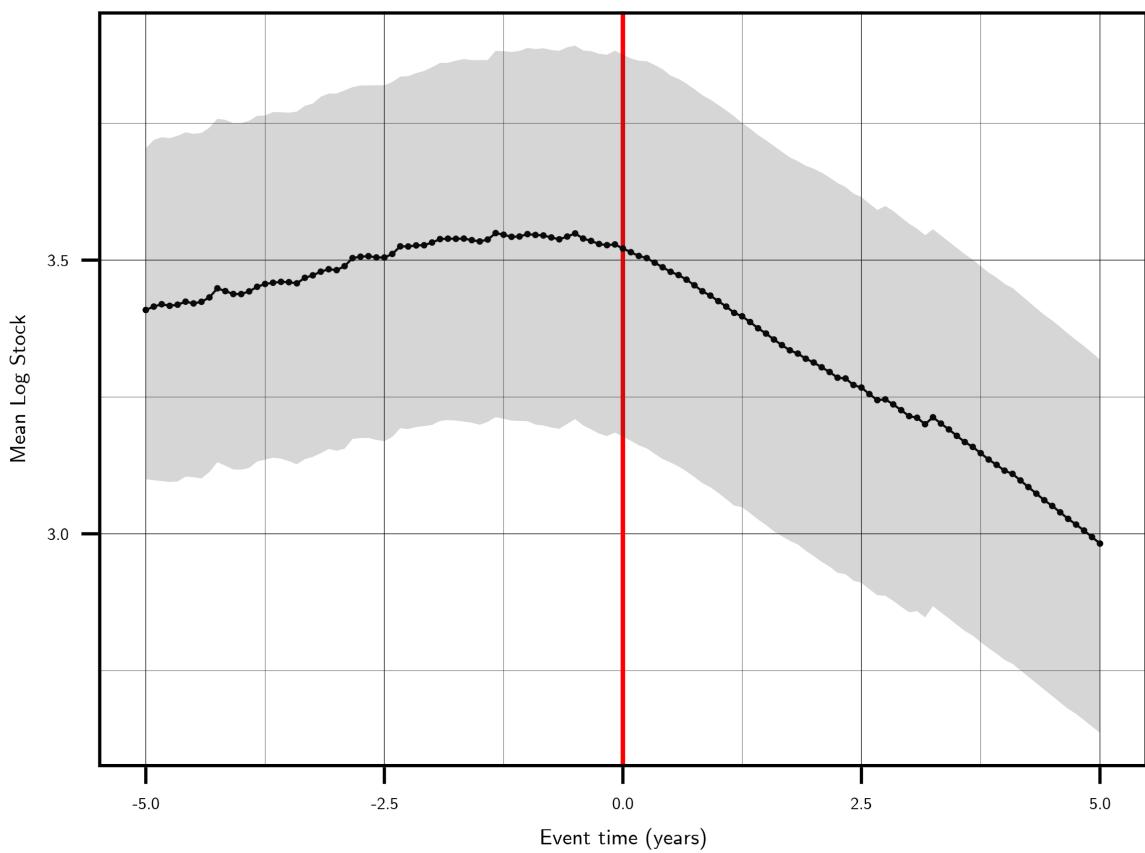


Figure 3.7: ITS, monthly stock calculation, log transformed quality-adjusted counts

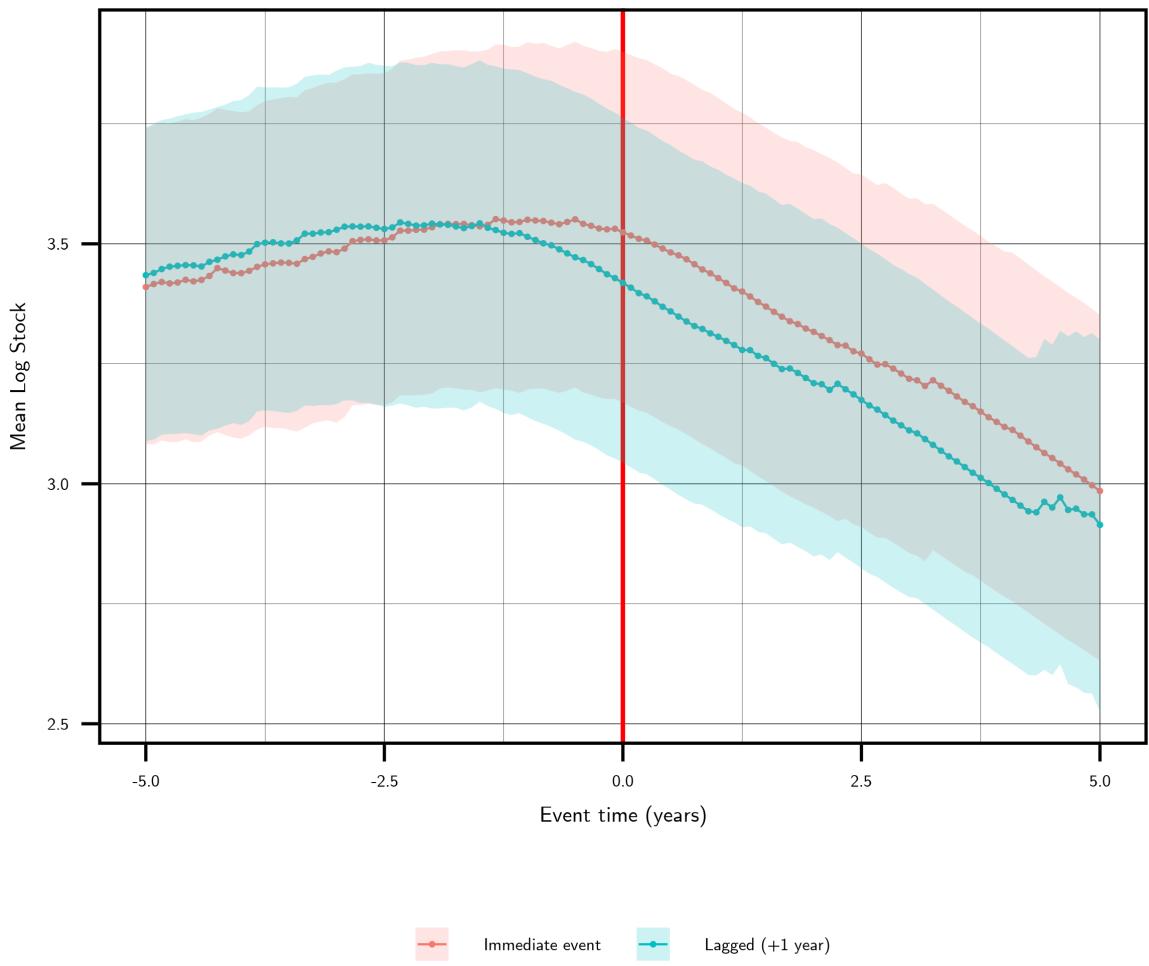


Figure 3.8: Event-lag comparison: ITS, monthly stock calculation, log transformed quality-adjusted counts

objectives, this suggests that the typical merger did not yield the hoped-for gains in innovative activity or technological improvement. To the extent that consolidation was motivated by a “national champions” logic, the findings here caution against assuming that greater organisational scale translates into higher innovative output in the short to medium run.

There are a string of qualitative data points which support this general picture. Hills (1981, p. 77) reports that, following the high-profile merger between GEC and AEI in 1967, the telecommunications R&D staff of AEI at Blackheath and Harlow sites were sacked, and the AEI research laboratories at Manchester and Rugby were closed down. A telephone exchange switching system developed by AEI at a cost of £40m—called REX—was also scrapped by GEC following the acquisition. GEC had already bought into a telephone exchange system based on a competing technology (electro-magnetic “cross-bar”, versus the reed relay technology of the REX system), developed by Plessey.

Further development of the reed-relay-based technology was left to the small R&D team of Standard Telephone Cables Ltd, which they were not ready to commercially implement until 1975. Meanwhile, the UK share of the OECD telecommunications market dropped from 12% in 1963 to 7% in 1969 (*ibid.*). The cross-bar telephone exchange system developed by Plessey, and kept by GEC, did not sell well abroad, and the culling of the REX system developed by AEI may explain a large proportion of this drop in telecommunications exports. GEC also let go of English Electric’s R&D staff at their Stafford site following their merger in 1968 (*ibid.*). These moves by GEC seemed to upset rather than achieve the IRC’s objectives on technological development and export growth.

In the case of the merger between George Kent and Cambridge Instruments, Hague and Wilkinson (2018, pp. 85–8) argues that both the IRC and Kent badly misjudged the ‘industrial logic’ behind bringing the two firms together. The main activities of each firm required different management skills and there was no strong overlap in their technological and marketing relationships. The IRC, in their initial statement on the merger, had believed that, ‘the high technological contribution of Cambridge will reinforce the industrial capability of Kent,’ (Industrial Reorganisation Corporation, 1969, p. 36).

Yet Kent almost immediately tried to reverse the merger, approaching a private company (Metals Research) to acquire the scientific instruments activities from them, and eventually selling them off to Brown Boveri in 1974 Hague and Wilkinson (2018, pp. 85–8). During the IRC's initial investigation into the sector, independent scientific instruments firms showed little interest in potential mergers, claiming that their key scientists and R&D personnel would work better outside of a large conglomerate Hague and Wilkinson (2018, p. 73).

When problem struck inside the newly-merged firms, it was often the R&D departments which were let go in order to cut costs. Following Whessoe's acquisition of the Stockton works of Ashmore, Benson, and Pease, the executive committee made substantial cuts to R&D expenditure and employment in 1970 Hague and Wilkinson (2018, p. 164). Similarly, a 'serious overrun on a major contract' (Industrial Reorganisation Corporation, 1970, p. 33), following successive IRC-sponsored acquisitions, led Davy Ashmore to call on the IRC's commitment to finance the rationalization of the steel and non-ferrous equipment industry. These financial difficulties led to the closing down of the group's mechanical engineering group and its R&D department. Hague and Wilkinson (2018, p. 179)

3.4.2 OPERATING PERFORMANCE

Financial Ratio Outcomes

Table 3.4 reports mean values of three profitability-based performance metrics—Return on Net Assets (RONA), Return on Capital Employed (ROCE), and Return on Equity (ROE)—in the periods before and after IRC-sponsored mergers. Means are calculated over three symmetric time windows: one year before and after the merger ($t-1$ to $t+1$), three years before and after ($t-3$ to $t+3$), and five years before and after ($t-5$ to $t+5$). Results are shown for all IRC mergers combined (Overall) and separately by whether the merger received direct IRC financial assistance (Finance = 1) or not (Finance = 0).

Across all three metrics, the post-merger means are consistently higher than the pre-merger means. For example, overall RONA rises from 0.108 to 0.126 in the 1-year window (a difference of 0.017) and from 0.112 to 0.139 in the 5-year window (a difference of 0.027). ROCE increases from 0.166 to 0.190 in the 1-year window (a 0.024 gain) and from 0.175 to

Table 3.4: Pre- and Post-Merger Means of Financial Ratios

| Window | | RONA | | | ROCE | | | ROE | | |
|--------|---------------------------------|-------|-------|----------|-------|-------|----------|-------|-------|----------|
| | | Pre | Post | Δ | Pre | Post | Δ | Pre | Post | Δ |
| 1-year | Overall <i>IRC financing</i> | 0.108 | 0.126 | 0.017 | 0.166 | 0.190 | 0.024 | 0.134 | 0.174 | 0.040 |
| | Finance = 0 | 0.107 | 0.120 | 0.013 | 0.164 | 0.181 | 0.016 | 0.127 | 0.160 | 0.033 |
| | Finance = 1 | 0.109 | 0.131 | 0.022 | 0.168 | 0.200 | 0.032 | 0.141 | 0.188 | 0.047 |
| 3-year | Overall <i>IRC financing</i> | 0.109 | 0.127 | 0.018 | 0.170 | 0.186 | 0.016 | 0.132 | 0.172 | 0.040 |
| | Finance = 0 | 0.111 | 0.127 | 0.016 | 0.176 | 0.184 | 0.008 | 0.129 | 0.165 | 0.036 |
| | Finance = 1 | 0.107 | 0.127 | 0.020 | 0.164 | 0.187 | 0.023 | 0.134 | 0.178 | 0.044 |
| 5-year | Overall <i>IRC financing</i> | 0.112 | 0.139 | 0.027 | 0.175 | 0.200 | 0.025 | 0.133 | 0.182 | 0.049 |
| | Finance = 0 | 0.112 | 0.141 | 0.029 | 0.180 | 0.199 | 0.018 | 0.129 | 0.179 | 0.050 |
| | Finance = 1 | 0.111 | 0.136 | 0.025 | 0.169 | 0.201 | 0.032 | 0.137 | 0.185 | 0.048 |

0.200 in the 5-year window (0.025 gain). ROE shows the largest rise, from 0.134 to 0.174 (a 0.040 gain) in the 1-year window and from 0.133 to 0.182 (a 0.049 gain) in the 5-year window. The results by financing status also indicate positive shifts, with financed mergers (Finance = 1) generally showing slightly larger post-merger gains in RONA and ROE than unfunded ones, particularly in the 1-year window where RONA rises by 0.022 and ROE by 0.047 among financed mergers.

These patterns suggest an overall improvement in operating performance following IRC mergers. The stronger performance of financed mergers, though not dramatic, is consistent with the idea that IRC funding may have supported post-merger restructuring or investment.

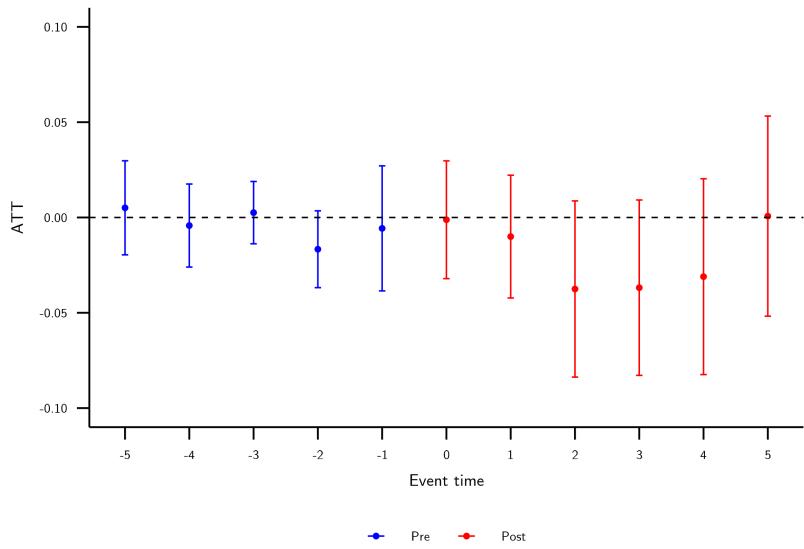
Despite the suggestive patterns, this descriptive pre/post design has several limitations. First, it does not control for underlying trends or shocks affecting firms regardless of merger activity, so post-merger gains could reflect broader sectoral conditions rather than causal merger effects. Second, firms may have been on different trajectories even before merging (selection bias), so pre/post differences may conflate merger effects with pre-existing performance trends. Third, compositional changes—such as exit of poorly performing firms—can mechanically raise post-merger means. Finally, the analysis ignores staggered treatment timing: mergers occur in different years, yet the method pools all firms as if they merged simultaneously.

Because of these limitations, the observed gains should not be interpreted as causal. To address these concerns, I now turn to the results of the difference-in-differences design, which

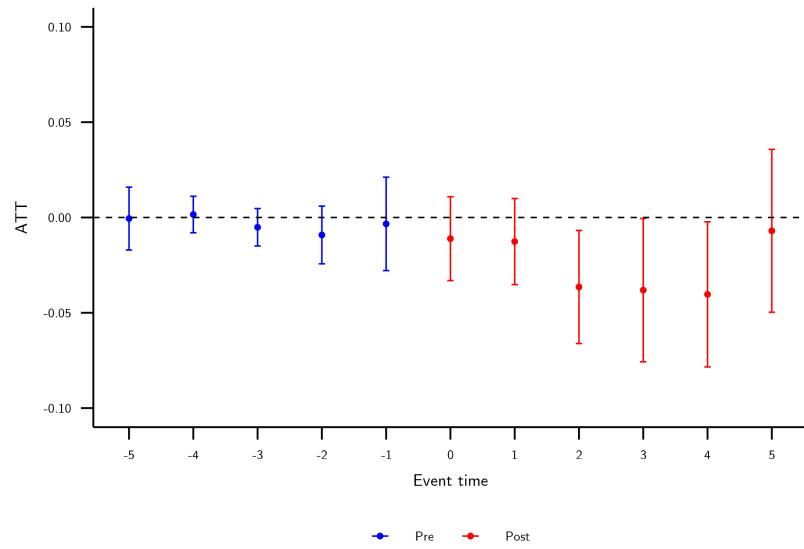
which explicitly accounts for staggered treatment timing, constructs appropriate comparison groups, and estimates dynamic treatment effects relative to the merger year.

The results for profitability and RONA are shown in Figures 3.9–3.10, with and without using the high-technology subset of non-merging firms as a control group. Plots for the additional outcomes (ROCE, ROE) are shown in Appendix 3C.

Overall, the results do not reveal any significant changes in operating performance following IRC-sponsored mergers. Across all specifications, treated firms show no evidence of systematic improvement relative to non-merging peers. These null findings are robust to the use of the alternative profitability ratios and to the specification with the high-technology comparison group. The evidence suggests that the mergers did not deliver measurable efficiency gains in the short-to-medium term, at least as captured by standard financial accounting ratios.



(a) Left: Profitability as outcome



(b) Right: RONA as outcome

Figure 3.9: Operating performance: Difference-in-difference results

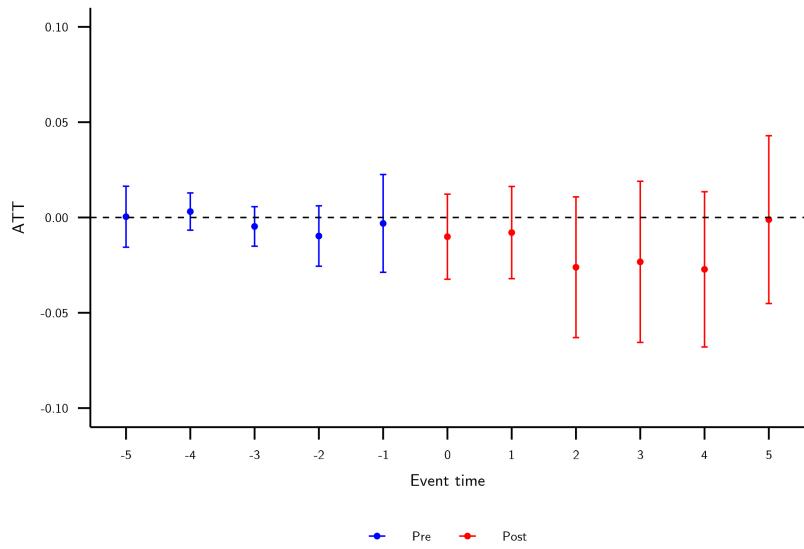
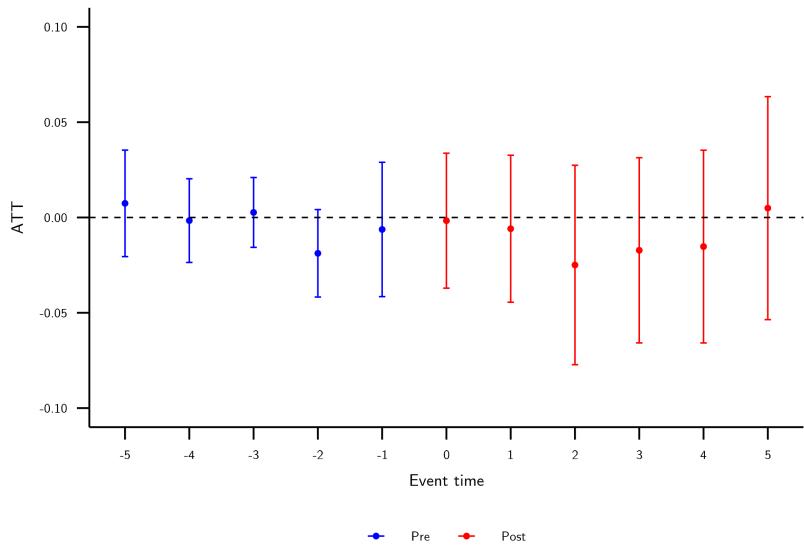
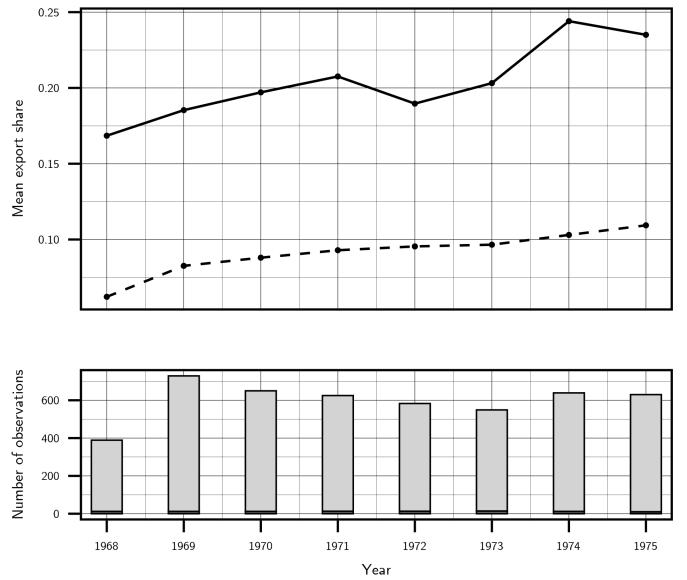


Figure 3.10: Operating performance: Difference-in-difference results with hi-tech control

Additional Analysis

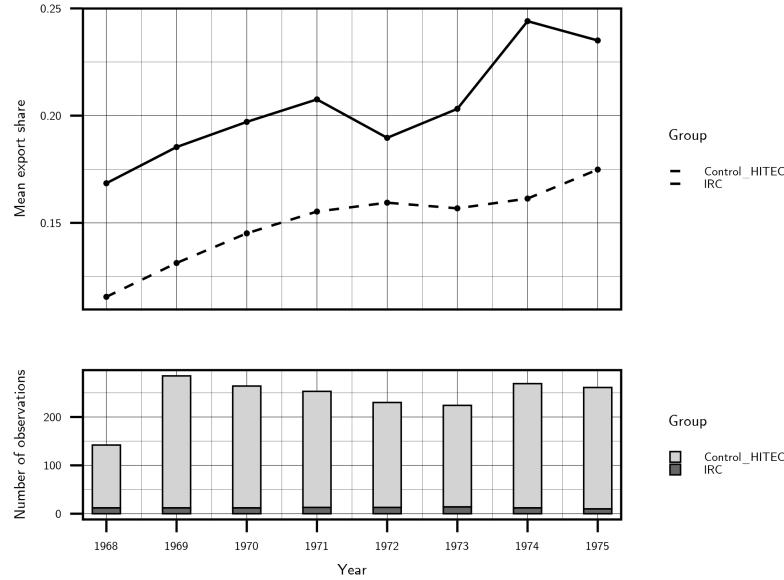
To probe a broader set of outcomes, I exploit the additional variables available from 1967 onwards: export intensity, asset turnover, operating margins, the employee-to-sales ratio, and growth in net assets. The results from this comparative analysis is shown in Figures 3.11–3.14, while the additional plots using the high-technology subset of comparison firms are shown in Appendix 3C.

Here too, there is little sign of transformative change. Data limitations mean that sample sizes are considerably smaller, and coverage is uneven across firms, which cautions against strong inference. Nonetheless, the broad patterns point to IRC-sponsored firms largely tracking wider economy-wide trends rather than diverging from them in ways consistent with step-changes in efficiency or competitiveness. (This conclusion also holds when the high-technology comparison group is used, as can be seen in the appendix.)

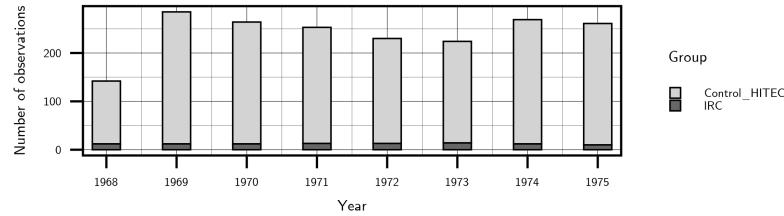


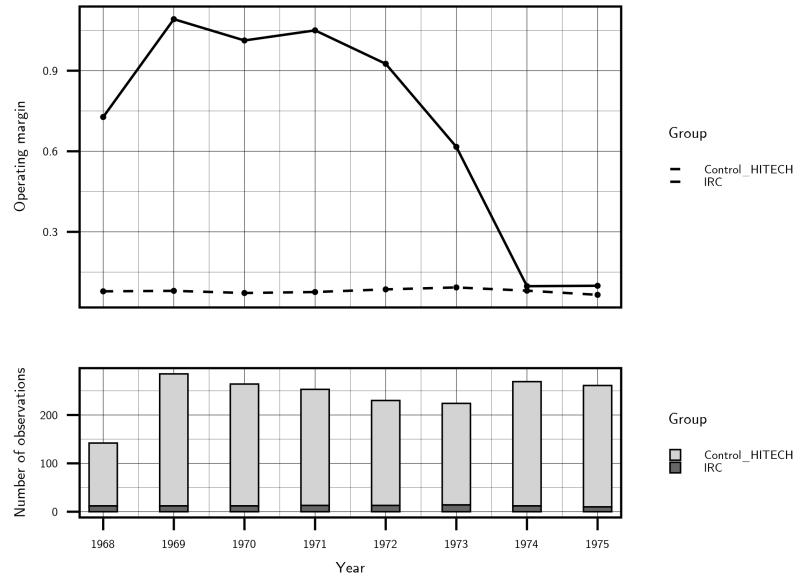
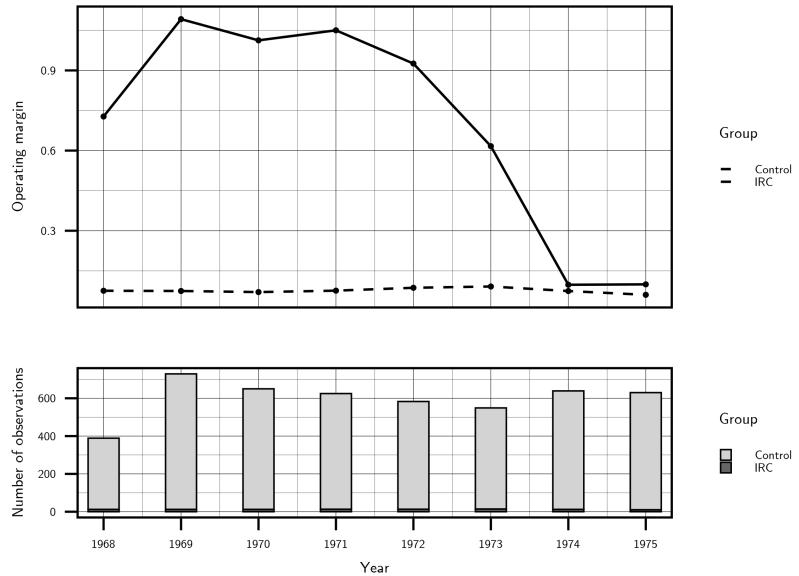
(a) Left: Export intensity

Group
— Control
- - - IRC



(b) Right: Export intensity, hi-tech comparison group

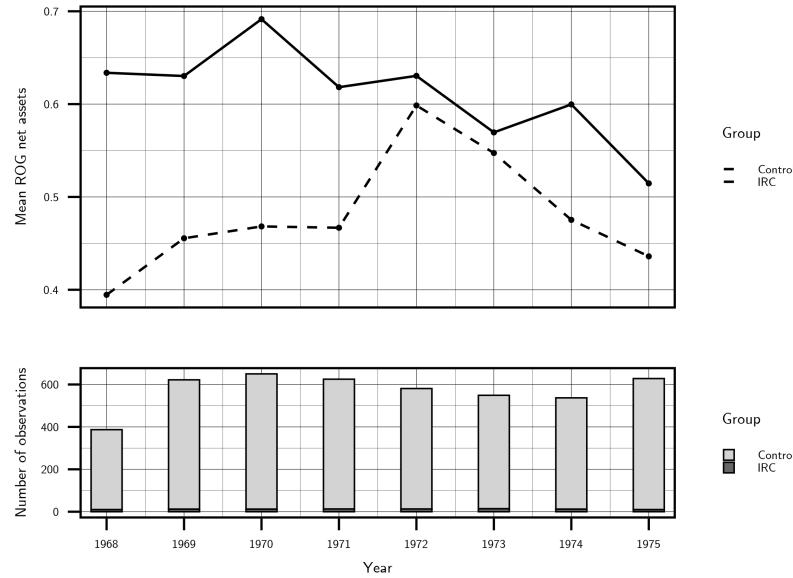
**Figure 3.11:** Export intensity: Comparison with non-IRC, non-acquirers



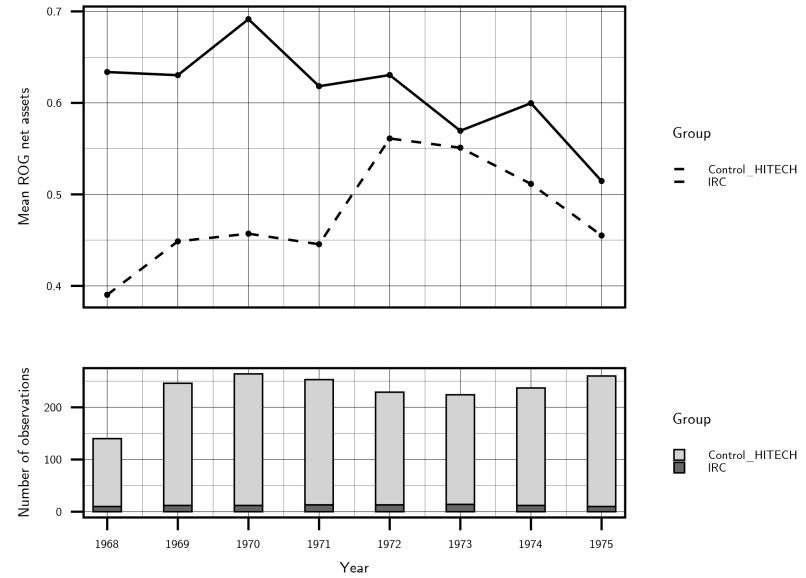
(a) Left: Operating margin

(b) Right: Operating margin, hi-tech comparison group

Figure 3.12: Operating margin: Comparison with non-IRC, non-acquirers

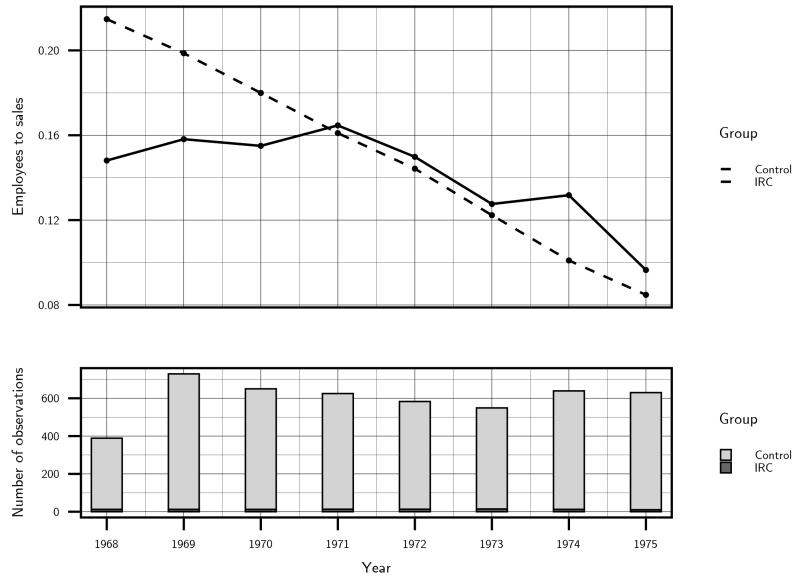


(a) Left: Net asset growth

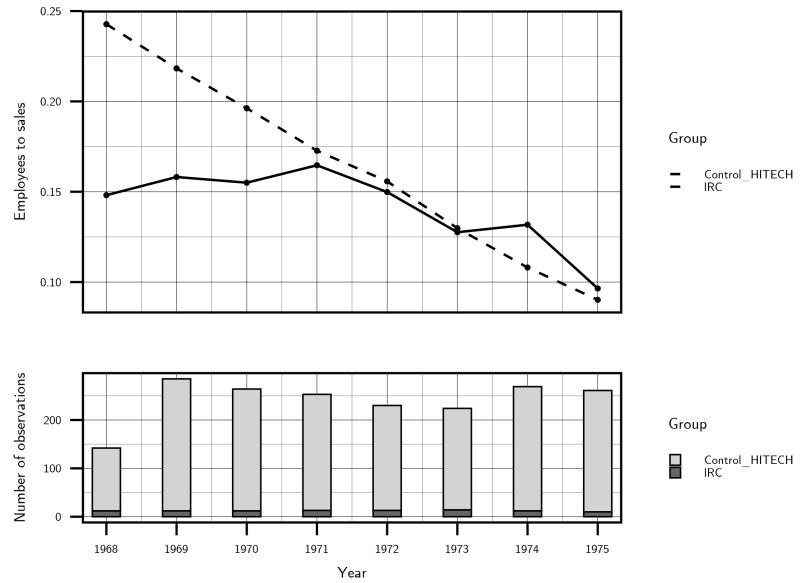


(b) Right: Net asset growth, hi-tech comparison group

Figure 3.13: Net asset growth: Comparison with non-IRC, non-acquirers



(a) Left: Employee-to-sales ratio



(b) Right: Employee-to-sales ratio, hi-tech comparison group

Figure 3.14: Employee-to-sales ratio: Comparison with non-IRC, non-acquirers

Overall, both the results of the DiD and simpler comparative trend analysis show that IRC-sponsored mergers did not generate the kinds of improvements in efficiency or competitiveness that policymakers envisaged. While the analysis is inevitably constrained by the available data, the absence of any clear post-merger gains in either profitability or broader performance metrics stands in marked contrast to the ambitious claims made for the policy at the time. Combined with the findings of the innovation outcomes results presented earlier, they cast doubt on the effectiveness of merger-led industrial policy as a tool for enhancing firm-level performance.

That mergers failed to generate clear gains is a consistent result in the wider literature. Meeks and Meeks (2022) lists 55 peer-reviewed studies of the impact of mergers on firm performance: covering 11 countries or regions in North America, Europe and Asia, incorporating both accounting and stock market returns data, and published over the period 1971–2020. In only 11 of these studies were mergers reported to have generated significant, positive effects on firm performance.

McGuckin and Nguyen (1995) found that, following recent mergers, plants of target firms experienced productivity improvements while the plants of the acquiring firm suffered productivity losses. The net change for the acquiring firm, once the target firm is incorporated, was essentially zero. This finding is confirmed by Schoar (2002). Although a lack of post-merger data on acquired firms in this setting means I cannot replicate this analysis fully, an interesting extension would be to break down the pre-merger operating performance of merging firms. The pre-merger composites which I construct, while conceptually the most valid approach, may obscure large pre-merger differences in operating performance across targets and acquirers.

3.4.3 STOCK MARKET RESPONSE

Table 3.5 reports three-day cumulative abnormal returns (CAR) around merger announcements, using FT-30, FT-500, and FT All-Share as alternative benchmarks. Results are expressed in percent; t -statistics (two-sided tests of $\text{mean}(\text{CAR}) = 0$) are shown in parentheses.

Across all 52 firm-merger observations, the average CAR is about 4.6–4.7% and statistically different from zero at conventional levels (FT-30: 4.62% ($t = 2.14$); FT-500: 4.72%

Table 3.5: Cumulative Abnormal Returns (CAR) in a 3-day window around merger announcements

| | Comparison Index | | | |
|----------------------|------------------|------------------|------------------|----|
| | FT-30 | FT-500 | FT All Share | N |
| <i>Overall</i> | 4.62% ** (2.140) | 4.72% ** (2.185) | 4.68% ** (2.168) | 52 |
| <i>IRC financing</i> | | | | |
| Finance=0 | 6.61% ** (2.118) | 6.72% ** (2.143) | 6.66% ** (2.127) | 34 |
| Finance=1 | 0.86% (0.467) | 0.94% (0.535) | 0.92% (0.527) | 18 |
| <i>Firm status</i> | | | | |
| Type=Acquirer | 0.26% (0.330) | 0.42% (0.514) | 0.38% (0.460) | 22 |
| Type=Target | 7.81% ** (2.164) | 7.87% ** (2.179) | 7.82% ** (2.170) | 30 |

Notes: Cells report Mean CAR (percent) with two-tailed t-statistics in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

($t = 2.19$); FT All-Share: 4.68% ($t = 2.17$)). The similarity across benchmarks indicates that the result is not driven by the choice of index. Economically, a 4–5% market-adjusted gain over a three-day window is sizeable for the period,²¹ and suggests that, on average, investors expected the mergers in the sample to create value (or at least be personally lucrative.)

Splitting the sample by whether the deal involved IRC/government financing reveals some divergence. For deals without IRC financing (34 observations), the mean CAR is roughly 6.6–6.7% and significant (FT-30: 6.61% ($t = 2.12$); FT-500: 6.72% ($t = 2.14$); FT All-Share: 6.66% ($t = 2.13$)). By contrast, for deals with IRC financing (18 observations) the average CAR is small and statistically indistinguishable from zero—around 0.9% with t -statistics near 0.5. This pattern suggests that the positive market response in the full sample is concentrated in non-financed mergers, whereas government-financed cases were not expected to yield immediate shareholder gains. Sir Ronald Grierson, the managing director of the IRC between 1966–67, questioned whether an organization like IRC even needed money to carry out its functions Hindley and Richardson (1983, p. 149), and these CAR results seem to hint that a scepticism towards financed deals was held more broadly.

Consistent with the wider merger literature (Jensen and Ruback, 1983; Jarrell et al., 1988; Franks and Harris, 1989; Andrade et al., 2001; Cumming et al., 2023), the gains accrue primarily to targets. Target firms exhibit mean CARs near 7.8% with t -statistics around 2.17

²¹Though smaller than the abnormal returns found by Franks and Harris (1989) for 1,800 UK takeovers in the period 1955–85. Their results are not reported by decade.

(significant), while acquirers record small, statistically insignificant effects (about 0.3–0.4%, $t \approx 0.3$ –0.5). There are several mechanisms which underlie this pattern in the literature. Acquirers must typically pay a premium to persuade target shareholders to sell, so immediate abnormal returns are capitalized into target share prices.²² Additionally, bidders often face the “winner’s curse,” in which the successful acquirer is the one most optimistic about potential synergies, leading to systematic overpayment (Roll, 1986). Acquirer firms’ managers may also have personal motives for pursuing mergers—such as “empire building”—that reduce expected value creation for their own shareholders (Jensen, 1986).

The announcement-window evidence indicates that the market, on average, anticipated value creation from these mergers, with benefits concentrated in target shareholders and in deals without IRC financing. These reflect short-run perceptions of the merger announcements rather than realized outcomes of the mergers themselves, of course. Accordingly, I treat the CAR results as a contemporaneous benchmark of investor beliefs. Interpreting these findings, therefore, is an exercise in interpreting investors’ beliefs. There are two main interpretations which I believe are reasonable.

Firstly, in light of the other analyses of innovation and operating performance, the results suggest divergence between expectations and realized outcomes for mergers. Warren Buffett, the doyen of fundamental investing, once quipped that while, ‘deals often fail in practice, they never fail in projections’ (Warren Buffett, 1982), and it is common to find short-run positive abnormal returns turning into long-run negative abnormal returns in merger share price studies, as well as discordance between short-run share price gains and longer-run operating performance deterioration. This suggests that investors may, ‘systematically fail to assess quickly the full impact of corporate announcements’ (Andrade et al., 2001, p. 112).

Another interpretation, more sympathetic to investors’ intelligence and foresight, is around strategic revaluation; that increased market power following mergers provides greater scope to raise prices or more generally exert influence over a market. (In Warren Buffett’s parlance, we might call this a widening of the “economic moat” that helps to protect firms’ market share (Warren Buffett, 2007)). A subset of the findings of Eckbo (1983) is consistent with this

²²cf. The discussion of the George Kent and Cambridge Instruments merger above.

market power hypothesis, based on calculating abnormal returns around public announcement for both merging firms and their rivals, while Stillman (1983) rejects the market power hypothesis with the same approach with a small sample of 11 horizontal mergers.²³

In any case, this analysis serves a useful purpose: it reveals how investors perceived these mergers at the time, even if those expectations did not materialize in subsequent operating or innovation performance. It is a reminder that market reactions capture beliefs rather than outcomes and that policy assessments cannot rest on such signals alone, especially when improvements to the “general” economic conditions are the primary objective. As the preceding sections show, the promise of greater efficiency and technological advance was far harder to realize in practice, highlighting the importance of complementing financial–market evidence with direct measures of firm performance.

3.5 CONCLUSION

Summary

This chapter has evaluated the Industrial Reorganisation Corporation’s (IRC) merger-driven industrial policy along three dimensions—innovative output, operating performance, and stock-market assessment—and situated the results within their historical and conceptual context.

On innovation, the evidence points consistently to decline. Interrupted time-series (ITS) estimates using monthly, log-transformed, quality-adjusted patent stocks show that post-merger trends turn significantly negative; the implied counterfactual gap five years after a merger is on the order of one-half ($\approx 52\%$) of the patent stock relative to the pre-merger trajectory. A complementary Callaway–Sant’Anna DiD analysis points to a similar conclusion, albeit with statistically imprecise results.

The analysis of operating performance yields no evidence of dramatic improvements. Across specifications using profitability and return on net assets (RONA) as headline measures, and return on capital employed (ROCE) and return on equity (ROE) as robustness

²³A natural addition to this analysis would be to collect share price data for the merging firms’ rivals also.

checks, there are no significant shifts in profitability following IRC-sponsored mergers. These null findings hold whether using broad controls or a high-technology comparison group, and remain consistent when extending the analysis to post-1966 data on outcomes like export intensity, operating margins, and asset growth, where limited sample coverage nonetheless points to IRC firms broadly tracking wider economic trends rather than outperforming them.

By contrast, equity markets registered short-term optimism. The share-price response analysis finds that three-day cumulative abnormal returns around merger announcements were, on average, positive: roughly 4.6–4.7% against standard FT benchmarks. Gains were concentrated in targets ($\approx 7.8\%$) rather than acquirers (insignificant at ≈ 0.3 – 0.4%), and in transactions without IRC/government financing (≈ 6.6 – 6.7%) rather than financed cases ($\approx 0.9\%$, not significant). These results may ultimately be driven by the increased market power which IRC-mergers delivered; the results of the innovation and operating performance analysis suggest this was not a worthwhile trade-off.

Overall, the implication of the results is that IRC-sponsored consolidation may have satisfied short-term expectations of scale and managerial redeployment without delivering the longer-term efficiency or technological upgrading that policy-makers sought. This cautions against weakening domestic merger control in pursuit of improved economic performance.

Consolidation can dull rivalry—blunting one of the strongest, most general incentives to invest in R&D—before managerial and technical synergies have time (or ability) to materialize. Integration frictions may also consume managerial bandwidth and cash flow that could otherwise be directed toward research and growth pipelines. And merger deals chosen for financial goals may privilege near-term balance sheet repair over longer-horizon improvements in efficiency.

Discussion

The merger policy underlying the Industrial Reorganisation Corporation can be viewed as a form of cargo cult thinking in economic policymaking. In the South Pacific after 1945, Melanesian villagers watched Allied aircraft vanish and, with them, the flow of tinned meat, radios and uniforms that had briefly up-ended local life. To coax back the “cargo” (in Melane-

sian pidgin English, cargo refers to all non-native material goods Aasved, 1996, p. 388) they cleared makeshift runways, built wooden control towers and staged drill-parades in imitation of American servicemen. The planes, of course, never landed. These movements were about confident mimicry: copying the visible structures of modern prosperity while misreading the hidden engines that make them work.

What the Wilson government's thinking around market structure and economic performance shows, is that this kind of mindset is not confined to Stone Age tribes. Alarmed by a widening productivity gap with the US, Germany, and France, his administration set out to recreate the organizational forms that seemed to underpin those nations' comparative success. Ministries, councils and conglomerates—all devoted to the objective of growth and innovation—sprang up like air-strips carved in jungle clearings. The imitation was faithful at the level of symbols (grand 'white-heat' speeches, five-year plans, engineering industrial amalgamations) but arguably flimsy at the level of causal mechanism.

The cargo never arrived. In the case of the IRC, where market structure emerged as the nexus between intervention and improved economic performance, they failed to recognize that the scale and concentration abroad were often the *outcome* of high performance rather than the *cause* of it. It treated size as a magic ingredient, rather than one derivative element of a more complex recipe for industrial success.

The IRC episode offers some clear takeaways for contemporary debates around national champions and industrial policy. In a period uniquely suited to test the promise of "big is innovative," the realized outcomes point the other way. Industrial policy that leans on mergers to generate dynamism risks repeating that mistake unless rivalry is safeguarded, undertakings on continuing investment in R&D are agreed on, and capability-building is front and centre.

More generally, we should be cautious about any industrial policy that substantially weakens competitive pressure in the domestic economy. Although it is unlikely that such a simplistic (to current minds) mode of thinking around size and scale *specifically* could prevail today, it is possible that some other *en vogue* factor or characteristic may prove seductive to current policymakers and governments, and come to be taken as the magic ingredient for macroeconomic rejuvenation.

The focus on the IRC alone overlooks some of the other projects of the Wilson government's industrial policy. For example, Edwards and Gandy (2019) highlight the creation of British Leyland, GEC's takeover of English Electric and the creation of International Computers Limited (ICL) as the 'three major outcomes' of the interventionist restructuring of industry in the attempt to secure the 'future of British mass and high technology manufacturing.' While these first two were IRC projects, the third (the creation of ICL) was engineered by Mintech.

Hendry (1989) covers the early British computer industry with a particular focus on government innovation policy. It includes a discussion of industrial structuring under the Wilson government, with details on the creation of ICL (pp. 153–160), although discussion of economics concepts around merger synergies, and the like, do not feature in the account. The general picture in the 1960s is one of declining presence in the global market and loss of market leadership, due to firms' short-sightedness and reluctance to adjust their strategies (p. 160)

There is the impression that British policy in computers was similarly biased towards promoting the large firms. In a comparison of the American and British experience, Hendry notes that, while in both countries the 'great majority of [financial] sponsorship was directed towards established firms', Britain lacked 'government-funded development contracts [which] also provided a starting point for entrepreneurial ventures' (p. 162). In fact, when, in 1966, Britain saw the establishment of a new computer manufacturing firm (Computer Technology Ltd.) the government actively discouraged it from applying to government purchase orders, instead preferring the existing firms (p. 12).

Drawing on the analysis of national innovation systems in Porter (1990), who advocated measures that encouraged domestic competition between firms, Hendry argued that government sponsorship of innovation must also be directed at small, young firms, and should also recognize the fact that firms will be more likely to change strategy when faced with defensive threats, rather than positive opportunities (p. 179).

APPENDICES

APPENDIX 3A IRC PROJECTS

Table 3.6 lists all of the relevant IRC merger cases which comprise the dataset for this chapter, where mergers are listed chronologically. Rightward arrows point to the surviving company in mergers. In some cases, the surviving company is a newly created company resulting from the merger. For brevity: the word ‘and’ is replaced with an ampersand in all company names, and suffixes denoting the legal structure of companies (e.g. ‘Ltd.’) is left out. Where finance was provided as part of the IRC sponsorship, the amount is indicated in the Finance column, in millions of £; when the value in the Finance column equals 0, this means the IRC sponsored the merger but provided no money. A list of firms involved in non-merger IRC projects is also available in 3.7.

Table 3.6: IRC projects: Sponsored Mergers

| ID | Firms | Date | Finance (£, m) |
|-----------|--|-------------|-----------------------|
| 1 | Elliott Automation ⇒ English Electric Co. | Jun 1967 | 15 |
| 2 | Associated Electrical Industries ⇒ General Electric Co. | Sep 1967 | 0 |
| 3 | Hadfields ⇒ Dunford & Elliott (Sheffield) | Oct 1967 | 0 |
| 4 | E.M.I + B.I.C. (Elliott) + Isotope Developments (Elliott) ⇒ Nuclear Enterprises ^a | Dec 1967 | 0.6 |
| 5 | West Riding Worsted & Woollen Mills ⇒ Coats Paton | Jan 1968 | 0 |
| 6 | Edwards High Vacuum International ⇒ British Oxygen Co. | Jan 1968 | 2.5 |
| 7 | Leyland Motor Corporation + B.M.H. ⇒ British Leyland Motor Corporation | Jan 1968 | 25 |
| 8 | W. H. Allen Sons & Co. + Belliss & Morcom ⇒ Amalgamated Power Engineering | Jan 1968 | 0 |
| 9 | Brightside Engineering Holdings + Tube Investments ⇒ Davy-Ashmore | Feb 1968 | 0 |
| 10 | Ashmore, Benson, Pease & Co. ⇒ Whessoe | Mar 1968 | 3.5 |
| 11 | Holman Brothers + Broom & Wade ⇒ International Compressed Air Corporation | Apr 1968 | 0 |
| 12 | Cambridge Instrument Co. ⇒ George Kent | Jun 1968 | 6.505 |
| 13 | Army Kinema Corporation + Royal Air Force Cinema Corporation ⇒ The Services Kinema Corporation | Jun 1968 | 0 |

Continued on next page

Table 3.6: IRC projects: Sponsored Mergers (Continued)

| ID | Firms | Date | Finance (£, m) |
|----|---|----------|-----------------|
| 14 | B&W + E.E.C. + T.W.C + A.E.A. ⇒ Babcock English Electric Nuclear ^b | Jul 1968 | 0 |
| 15 | Armstrong Whitworth (Metal Industries) ⇒ Davy-Ashmore | Aug 1968 | 0 |
| 16 | English Electric Co. ⇒ General Electric Co. | Sep 1968 | -5 ^c |
| 17 | Harland Engineering ⇒ The Weir Group | Oct 1968 | 0 |
| 18 | Sigmund Pulsometer Pumps ⇒ Plenty & Son | Nov 1968 | 0 |
| 19 | Johnsons Rolls ⇒ British Rollmakers Corporation | Dec 1968 | 0 |
| 20 | Various ⇒ The Nuclear Power Group ^d | Dec 1968 | 0 |
| 21 | The Weir Group + Worthington-Simpson ⇒ Studebaker-Worthington Inc. | Jan 1969 | 0 |
| 22 | Controls & Communications ⇒ Racal Electronics | Jan 1969 | 0 |
| 23 | Brown Bayley Steels + Hoffmann Manufacturing Co. ⇒ IRC | Jan 1969 | 5.37 |
| 24 | Donside Paper Mill ⇒ Reed Paper Group + Bowater Paper Corporation | Jan 1969 | 2 |
| 25 | Newman Hender ⇒ Pegler Hattersley | Feb 1969 | 0 |
| 26 | Sir William Arrol & Co. + Wellman Engineering Group ⇒ Clarke Chapman | Feb 1969 | 2 |

Continued on next page

Table 3.6: IRC projects: Sponsored Mergers (Continued)

| ID | Firms | Date | Finance (£, m) |
|----|---|----------|----------------|
| 27 | R. H. Windsor ⇒ Guest Keen & Nettlefolds | Mar 1969 | 0 |
| 28 | Bruce Peebles ⇒ Reyrolle Parsons | Mar 1969 | 0 |
| 29 | Dobson Hardwick + William Park & Co. ⇒ Dobson Park Industries | Mar 1969 | 0 |
| 30 | Ross Group + Associated Fisheries ⇒ British United Trawlers | Apr 1969 | 0 |
| 31 | Rowntree & Co. + John Mackintosh & Sons ⇒ Rowntree Mackintosh | Apr 1969 | 0 |
| 32 | H. F. Hartley ⇒ Allied Textile Companies | Apr 1969 | 1 |
| 33 | Pollard + Ransome & Marles + Hoffmann ⇒ Ransome Hoffmann Pollard | May 1969 | 9.461 |
| 34 | Fletcher & Stewart + A. G. Wild & Co. ⇒ Richard Sutcliffe | May 1969 | 0 |
| 35 | Bonser Engineering ⇒ Dowty Group | Jun 1969 | 0 |
| 36 | AEI, Supertension Cables Division ⇒ British Insulated Callenders Cables | Jul 1969 | 0 |
| 37 | Enfield Standard Power Cables ⇒ Pirelli General Cable Works | Jul 1969 | 0 |
| 38 | Osborn-Hadfields Steel Founders ⇒ The Weir Group | Jul 1969 | 1.25 |
| 39 | Simon Engineering ⇒ Davy-Ashmore ^e | Jul 1969 | 1.2 |

Continued on next page

Table 3.6: IRC projects: Sponsored Mergers (Continued)

| ID | Firms | Date | Finance (£, m) |
|----|---|----------|----------------|
| 40 | Priestman Brothers ⇒ The Steel Group | Aug 1969 | 1 |
| 41 | Leyland & Birmingham Rubber Co. ⇒ BTR Industries | Sep 1969 | 0 |
| 42 | Airmec-AEI ⇒ The Plessey Co. | Oct 1969 | 0 |
| 43 | Special Products Group (English Electric) ⇒ Rotax (Joseph Lucas Industries) | Nov 1969 | 3 |
| 44 | Super Oil Seals & Gaskets ⇒ Aeroquip | Nov 1969 | 0 |
| 45 | Ferranti Numerical Control Activities ⇒ The Plessey Co. | Dec 1969 | 3 |
| 46 | Reavell & Co. (James Howden & Godfrey) ⇒ I.C.A.C. ^f | Dec 1969 | 0 |
| 47 | Anderson Mavor ⇒ Dowty Group | Dec 1969 | 0 |
| 48 | Brook Motors ⇒ Hawker Siddeley Group | Jan 1970 | 0 |
| 49 | Klinger Manufacturing Co. ⇒ Qualitex Yarns | Feb 1970 | 2 |
| 50 | Permutit Co. ⇒ Portals Holdings | Apr 1970 | 0 |
| 51 | SPP Group, Gateshead Division (Booker McConnell) ⇒ Ingersoll-Rand Pumps | Apr 1970 | 0 |
| 52 | General Precision Systems (Singer Corporation) ⇒ Miles Roman | May 1970 | 0.211 |

Continued on next page

Table 3.6: IRC projects: Sponsored Mergers (Continued)

| ID | Firms | Date | Finance (£, m) |
|----|--|----------|----------------|
| 53 | Stott & Smith ⇒ Spirella | Jun 1970 | 1.3 |
| 54 | John Thompson ⇒ Clarke Chapman | Jun 1970 | 5 |
| 55 | Bamag Verfahrenstechnik GmbH ⇒ Power Gas Corporation | Aug 1970 | 0 |

^a E.M.I = Electric & Musical Industries; B.I.C. = Baldwin Instrument Co. Acquisition concerned nucleonic instrument activities within target firms.

^b B&W = Babcock & Wilcox; E.E.C. = English Electric Co.; T.W.C. = Taylor Woodrow Construction; A.E.A. = Atomic Energy Authority. Resulting firm was subsequently renamed British Nuclear Design & Construction.

^c Repayment of IRC loan to English Electric made at time of Elliott Automation acquisition.

^d IRC joined with Reyrolle Parsons Sir Robert McAlpine & Sons, Clarke Chapman, John Thompson, Head Wrightson, Strachan & Henshaw, Whessoe, and the Atomic Energy Authority to establish The Nuclear Power Group. IRC took up 10% equity.

^e Merger agreement fell through.

^f I.C.A.C. = International Compressed Air Corporation.

Table 3.7: IRC projects: Other

| ID | Firms / Title | Date | Finance (£, m) | Description |
|-----------|--|-------------|-----------------------|--|
| 56 | Rootes Motors + Chrysler Corporation | Jan 1967 | 1.66 | Acquisition of Rootes equity from Chrysler - 7,561,140 7% Cumulative Preferred Ordinary shares. |
| 57 | Telecommunications Industry Survey | Jan 1967 | 0 | Analysis of structure of telecommunications industry and its relation with the Post Office. |
| 58 | Paper and Board Industry Survey | Nov 1967 | 0 | Analysis of structure of paper industry. |
| 59 | Reed Paper Group | Feb 1968 | 1.5 | Section 2(1)(b) - loan to finance two plants (for de-inking and reconstituting paper). |
| 60 | Peter Dixon | Jul 1968 | 0.35 | Section 2(1)(b) - loan to finance plant (for de-inking and reconstituting paper). |
| 61 | National Film Finance Corporation Report | Sep 1968 | 0 | Advice to Board of Trade on capital structure and other commercial and financial aspects of National Firm Finance Corporation. |

Continued on next page

Table 3.7: IRC projects: Other (Continued)

| ID | Firms / Title | Date | Finance (£, m) | Description |
|-----------|-----------------------------------|-------------|-----------------------|--|
| 62 | Davy-Ashmore | Jul 1969 | 1.25 | Loan provided following a 'serious overrun on a major contract,' alongside Finance Corporation for Industry and company's bankers. £5m total loan. |
| 63 | Bacon Curing Industry Survey | Oct 1969 | 0 | Analysis of structure of bacon industry. |
| 64 | Samuel-Osborn & Co. | Feb 1970 | 1.75 | Loan for rationalizationad re-equipment of steel-making and processing facilities. |
| 65 | Marwin Holdings | Mar 1970 | 1.5 | Loan for expansion of production of numerically controlled machine tools. |
| 66 | Rolls-Royce | May 1970 | 10 | Section 2(1)(b). Loan for financing company programmes. |
| 67 | Herbert-Ingersoll | May 1970 | 1 | Section 2(1)(b). Loan for financing expansion of Daventry factory. |
| 68 | British Leyland Motor Corporation | Jun 1970 | 1 | Loan for company purchase of machine tools to modernize and expand production facilities. |

Continued on next page

Table 3.7: IRC projects: Other (Continued)

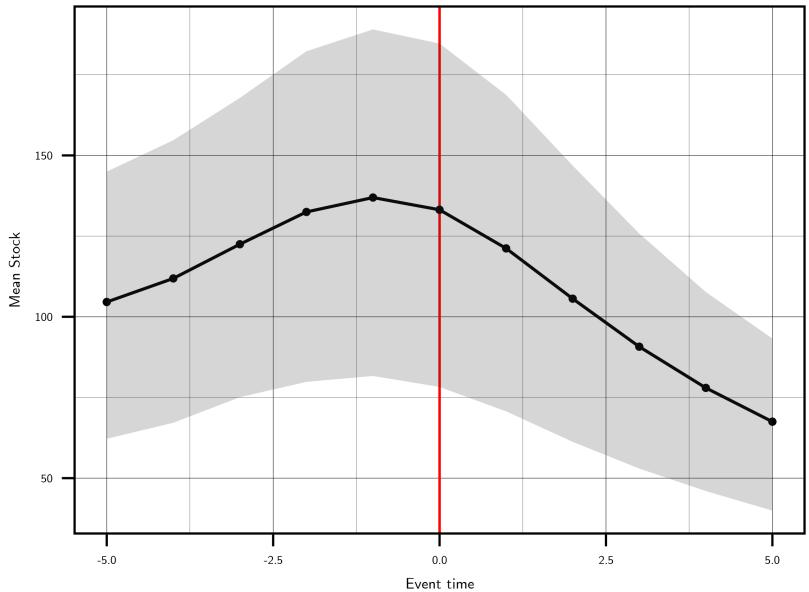
| ID | Firms / Title | Date | Finance (£, m) | Description |
|----|---------------------------------------|-------------------|----------------|---|
| 69 | Cammell Laird Group ⇒ The Laird Group | Jun 1970 | 3.82 | Reorganization to enable IRC financing of group activities, prompted by heavy losses in shipbuilding subsidiary. |
| 70 | Spirella | Jun 1970 | 1.3 | Financing restructuring of household textile industry. |
| 71 | <i>Various^a</i> | Oct 1970–Apr 1971 | 2.3 | Scheme for financing re-equipment by medium- and small-sized companies in the cotton and allied textile industry. |
| 72 | Kearney & Trecker | Dec 1970 | 0.3 | Equity subscription (approx. 31%) for financing company expansion. |

^a Harwood Cash and Co. + Perserverance Mill + Highams + Albert Hartley (Vantona) + Ainsworth Mills (Vantona)

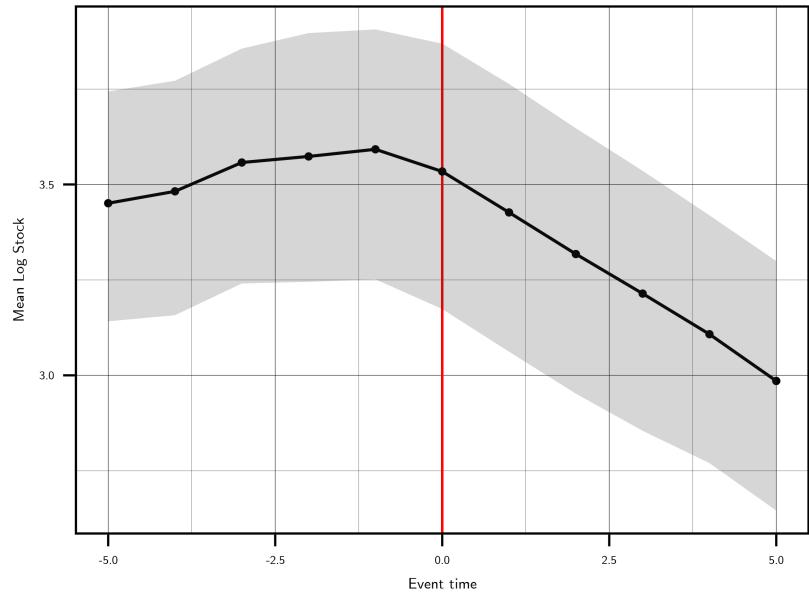
APPENDIX 3B INNOVATIVE OUTCOMES APPENDIX

Additional Figures

Below are the alternative figures referenced in Section 3.4.1. These show the results of the interrupted time series analysis when different versions of the calculated patent stock is used as an input. The overall picture does not change as a result of changing the way in which the stock is calculated: point estimates of patent stock decline substantially five years following merger announcement.

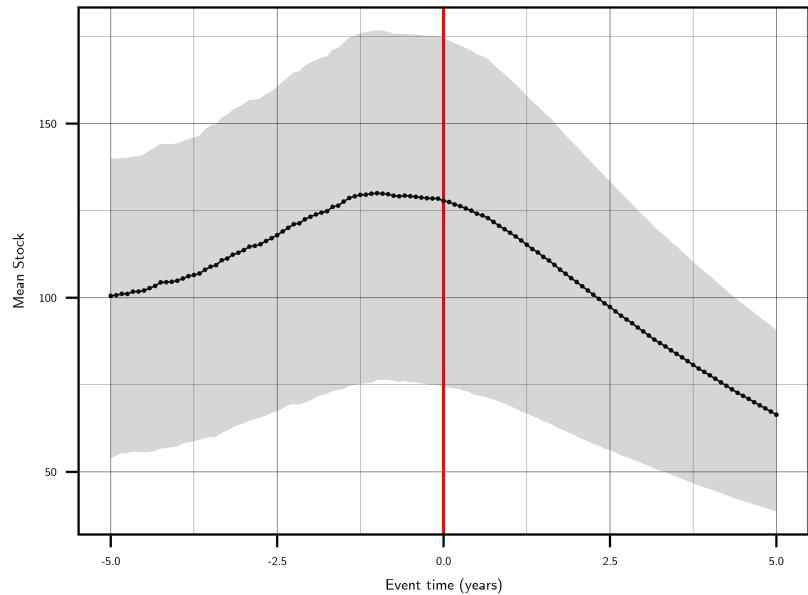


(a) Left: Annual stock calculation, raw quality-adjusted counts

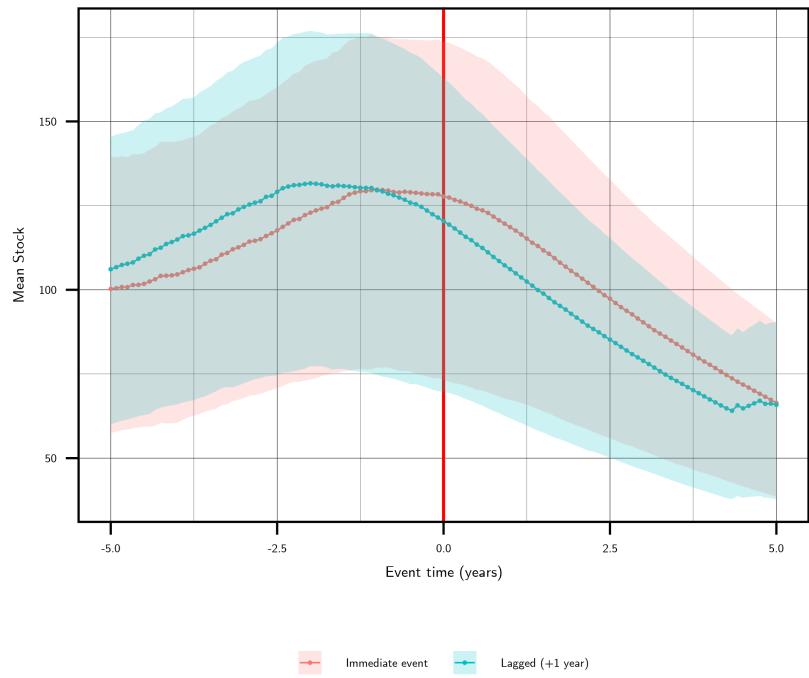


(b) Right: Annual stock calculation, log-transformed quality-adjusted counts

Figure 3.15: Innovative output: Additional ITS results (I)



(a) Left: Monthly stock calculation, raw quality-adjusted counts



(b) Right: Monthly stock calculation, raw quality-adjusted counts, lagged comparison

Figure 3.16: Innovative output: Additional ITS results (II)

Alternative analysis

A standard alternative approach to the ITS analysis would be to estimate an event-study regression with firm fixed effects, which compares outcomes of treated firms to those of control firms before and after treatment.

Recent work has shown that conventional two-way fixed effects estimators can produce misleading results when treatment effects are heterogeneous across cohorts or over time, due to problematic weighting (Goodman-Bacon, 2021; Sun and Abraham, 2021). To address this limitation, I choose here to estimate dynamic treatment effects using the method of Callaway and Sant'Anna (2021).

The Callaway–Sant’Anna (CS) estimator constructs average treatment effects by comparing each cohort of treated units to appropriate not-yet-treated or never-treated units; here, the treatment group consists of firms that undergo a merger in period t , and I opt for a control group consisting of firms which are not-yet-treated in period t . The estimator then compares the outcomes of treated and control firms using explicit weighting schemes, adjusting for the staggered adoption of mergers across groups, and aggregates these comparisons into event-time estimates.

The approach generalizes the traditional difference-in-differences to settings with staggered treatment timing, as is the case in this setting with firms merging at different times; importantly, this means delivering consistent estimates in the presence of treatment effect heterogeneity. It also allows for event-study style plots of dynamic treatment effects relative to the merger. I implement the doubly robust version of the CS estimator, which combines outcome regression with inverse probability weighting, yielding improved efficiency and robustness to model misspecification.

Section 3.3.1 lists many reasons why constructing a valid external control group has inherent difficulties in this context, which is why I restrict attention to a within-population, not-yet-treated design (i.e. the control group consists of firms within the IRC-sponsored population that had not yet received IRC support at the time treated firm underwent intervention.) The credibility of this approach rests on the fact that all firms in the sample were potential IRC

Table 3.8: Estimates of Merger Effects on Patent Stock (Callaway–Sant’Anna Estimator)

| | Estimate | Std. Error | 95% CI Low | 95% CI High |
|----------------------------------|----------|------------|------------|-------------|
| Annual: Stock (level) | -19.023 | 17.061 | -52.463 | 14.418 |
| Annual: Log(1+stock) | -0.052 | 0.036 | -0.122 | 0.019 |
| Monthly immediate: Stock (level) | -19.843 | 11.383 | -42.153 | 2.467 |
| Monthly immediate: Log(1+stock) | -0.047 | 0.021 | -0.088 | -0.006 |
| Monthly +12m lag: Stock (level) | -29.02 | 12.671 | -53.856 | -4.185 |
| Monthly +12m lag: Log(1+stock) | 0.011 | 0.049 | -0.085 | 0.108 |

Notes: Table reports overall ATT estimates from Callaway–Sant’Anna (2021) DiD procedure. All models use group-time average treatment effects aggregated with the “simple” option. Standard errors are clustered by merger group. CI = confidence interval.

beneficiaries and that differences in treatment timing were driven by policy priorities, sectoral structure, and negotiations with management—not by short-run fluctuations in patenting. (In plain terms: a firm did not receive IRC support because of a sudden blip in its patenting just before the intervention.)

Results of the CS analysis are reported in Table 3.8 and these are plotted in Figures 3.17–3.19. Across all specifications, the estimates suggest either negative or negligible impacts of mergers on the quality-adjusted patent stock, although statistical precision varies considerably.

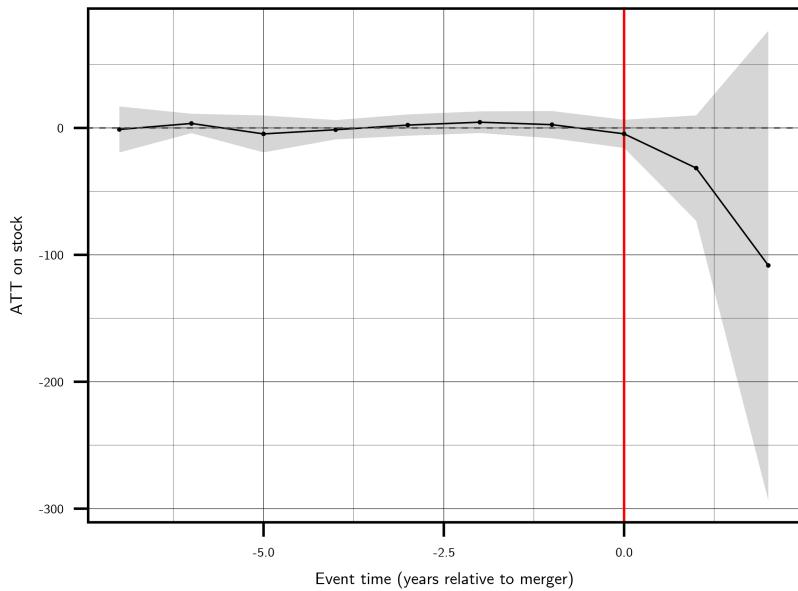
At the annual frequency, the estimated effect on the raw patent stock is negative (-19.0), but imprecisely estimated with a wide confidence interval crossing zero. When the outcome is log-transformed, the coefficient is also negative (around -0.05), and here the 95% confidence interval nearly excludes zero, suggesting a more consistent pattern of post-merger decline in relative terms.

The monthly analysis, which provides finer-grained temporal resolution, shows clearer evidence of decline. Using the immediate merger date, the effect on stock levels is -19.8, with the 95% confidence interval just above zero. The log specification shows a statistically significant reduction of about -0.05, with a confidence interval that excludes zero. These results imply that the downturn in patenting becomes visible at higher frequency and in relative terms.

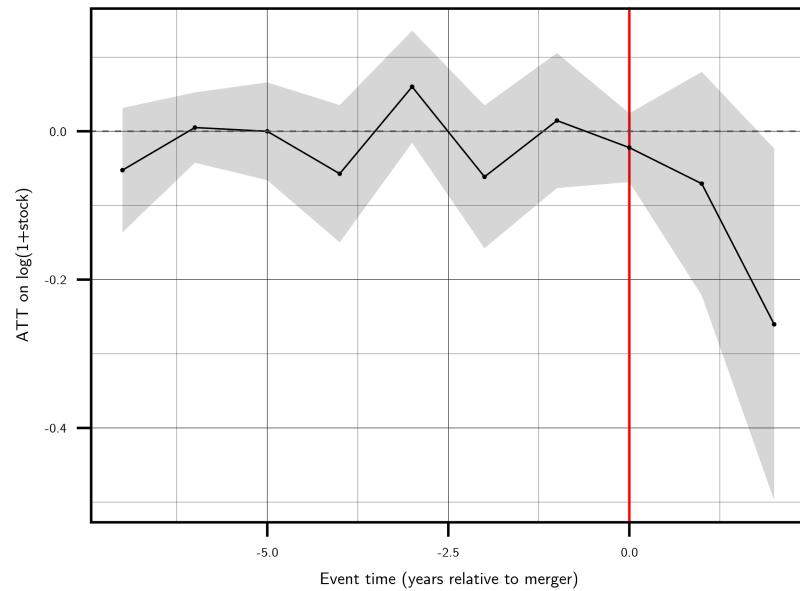
When the event date is shifted twelve months forward to reflect the potential lag between announcement and completion, the results are qualitatively similar. The stock-level estimate is even larger in magnitude (-29.0) and statistically significant, while the log specification

returns a small and insignificant coefficient. This pattern suggests that whether one takes the merger as immediate or lagged, the overall picture is of a contraction in patenting activity following merger, with stronger evidence in the level specification.

Overall, the CS estimates broadly confirm the impression that IRC mergers were associated with reductions in innovative output, though the strength of the results depends on the specification. The most robust finding is the significant decline in log patent stock in the monthly analysis, while other specifications point in the same direction but with weaker precision. These results reinforce the conclusion that merger policy under the IRC was not accompanied by enhanced innovative performance.

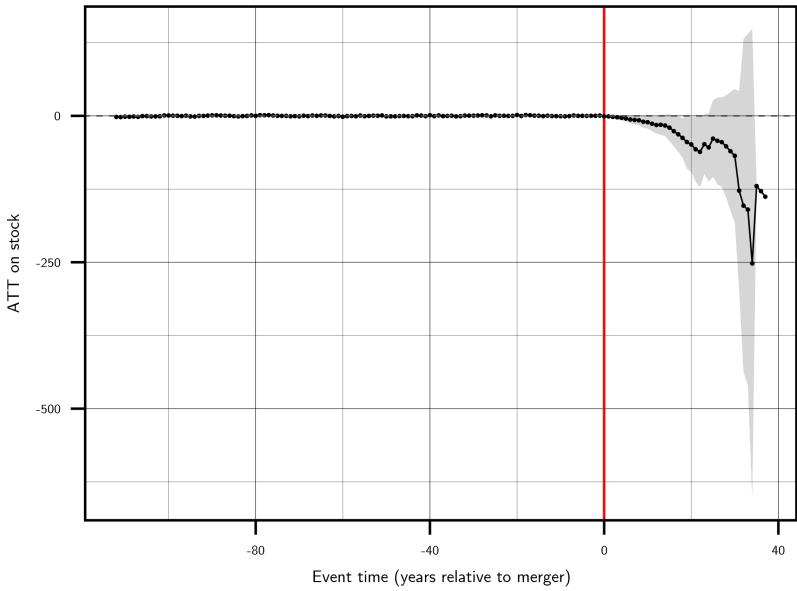


(a) Left: Annual stock calculation, raw quality-adjusted counts

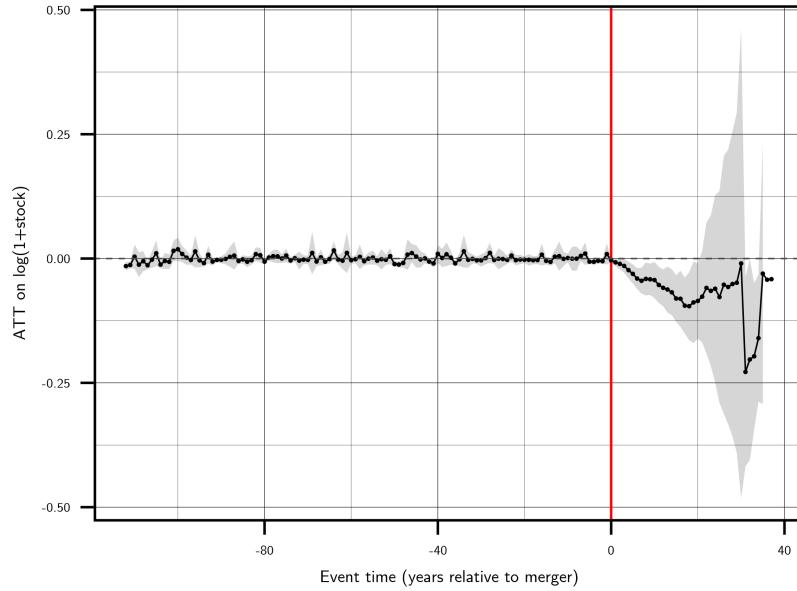


(b) Right: Annual stock calculation, log-transformed quality-adjusted counts

Figure 3.17: Innovative output: Difference-in-difference results (I)

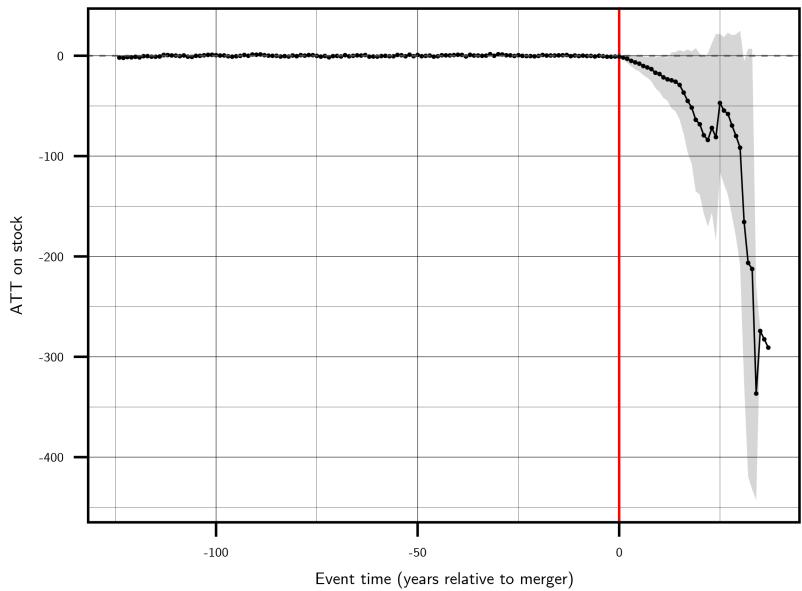


(a) Left: Monthly stock calculation, raw quality-adjusted count

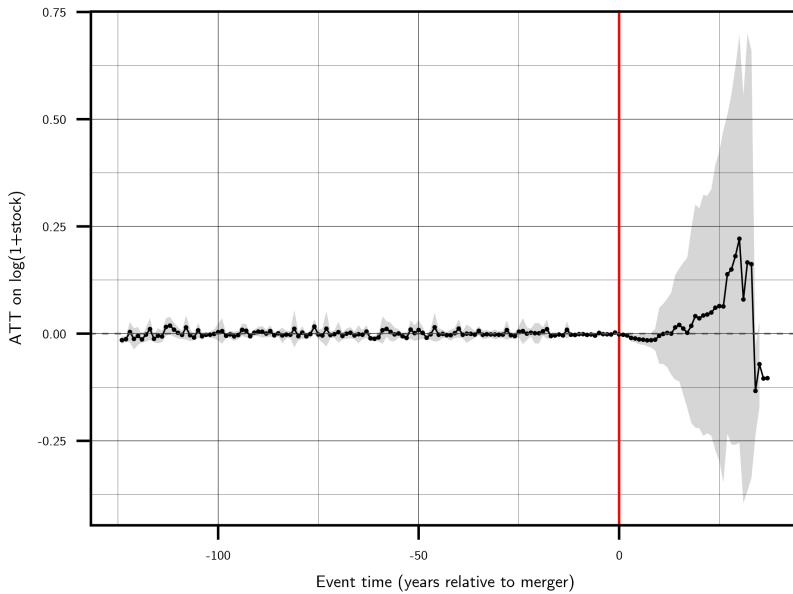


(b) Right: Monthly stock calculation, log-transformed quality-adjusted counts

Figure 3.18: Innovative output: Difference-in-difference results (II)



(a) Left: Monthly stock calculation, raw quality-adjusted counts, lagged 12 months



(b) Right: Monthly stock calculation, log-transformed quality-adjusted counts, lagged 12 months

Figure 3.19: Innovative output: Difference-in-difference results (III)

It is tempting to augment the CS DiD design with firm-level observables—size, profitability (ROA), leverage, and pre-merger innovation proxies—because, in principle, such covariates can (i) reduce residual variance, (ii) improve the plausibility of (conditional) parallel trends, and (iii) absorb baseline differences in innovative capacity unrelated to the merger. Importantly, however, such controls are *not required* for point identification in the CS framework: when overlap holds, the untreated potential outcomes are identified off comparisons to not-yet-treated units within cohort–time cells; the role of (the set of control variables) X is primarily to improve precision and robustness rather than provide identification per se.

With that being said, adding controls proved infeasible in this setting for two distinct reasons:

1. **Sample attrition from missing covariates.** I can construct financial controls only for *listed* firms. Many IRC mergers include at least one unlisted party, so requiring controls forces me to drop a non-trivial share of mergers. This shrinks the number of treated units in each adoption cohort (1967–1970) and further thins the pool of not-yet-treated units available in each calendar year to serve as controls.
2. **Failure of overlap/positivity once controls are included.** Even after restricting to the subset with controls, the panel saturates quickly: by 1969 there are only a handful of not-yet-treated firms; by 1970 there are none. In that environment, conditioning on highly predictive pre- t variables (e.g. pre-trend in patenting, mean patent flow, size/ROA/leverage) creates cohort–time cells with effectively zero support (no valid not-yet-treated comparators), leading to quasi-separation in the auxiliary outcome/propensity models and missing $\widehat{ATT}_{g,t}$ estimates. Truncating the event window mitigates but does not eliminate this structural problem; for some cohorts the truncated window then contains too few pre- t observations to identify a within-unit counterfactual.

These constraints imply that the binding limitation is support, not the absence of controls per se. Where support exists (early post-merger years and earlier adoption cohorts), the uncontrolled CS estimator runs cleanly and delivers effects that cohere with the interrupted time-series (ITS) evidence. By contrast, insisting on controls (i) restricts the sample

to listed-only mergers and (ii) exacerbates already tight support, producing non-estimation precisely in the late periods of substantive interest. Accordingly, the analysis below reports CS estimates without covariates on the full sample of IRC mergers, which is the specification best supported by the data.

The ITS and CS estimator analysis are complementary. The ITS analysis provides a transparent, visual description of innovation trajectories before and after mergers, while bootstrapped confidence intervals quantify sampling uncertainty. The CS estimator, in turn, provides a more rigorous causal framework that accounts for treatment heterogeneity and staggered adoption, addresses the key limitation of ITS by introducing a credible counterfactual, and allows us to rule out some alternative explanations such as mean reversion. Although, the quality of the CS analysis here could be greatly improved, it suffices as an additional sanity check on the main results.

APPENDIX 3C OPERATING PERFORMANCE APPENDIX

This appendix provides supplementary material for the analysis of operating performance carried out in the chapter. It includes 1) a list of variables included in the Cambridge-DTI dataset; 2) additional results (presented graphically) of the difference-in-difference analysis and the comparative analysis to non-IRC firms; and 3) the equations used to calculate several variables in the analysis.

Cambridge-DTI dataset variables

Table 3.9 lists the data available in the Cambridge-DTI dataset. This is constructed using the manual and help files provided alongside the dataset, which itself does not contain variable names. The variables used in this thesis can be reconstructed by downloading the Cambridge-DTI dataset and performing the calculations in the various equations using the stated variable IDs.

Table 3.9: Cambridge-DTI dataset variables

| Variable ID | Name | Years available |
|-----------------------------|---|------------------------|
| <i>Capital and reserves</i> | | |
| 1 | Issued capital: ordinary | 48– |
| 2 | Issued capital: preference | 48– |
| 3 | Capital and revenue reserves | 48– |
| 4 | Provisions | 48–63 |
| 5 | Future tax reserves | 48– |
| <i>Memorandum</i> | | |
| 6 | Contracts for capital expenditure outstanding | 48– |
| <i>Liabilities</i> | | |
| 7 | Interest of minority shareholders in subsidiaries | 48–63 |
| 8 | Long-term liabilities | 48– |
| 9 | Bank overdrafts and loans | 48– |
| 10 | Trade and other creditors | 48– |

Continued on next page

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--------------------|---|------------------------|
| 11 | Dividends and interest liabilities | 48– |
| 12 | Current taxation liabilities | 48– |
| <i>Memorandum</i> | | |
| 13 | Total depreciation | 48– |
| <i>Assets</i> | | |
| 14 | Fixed assets: tangible, net of depreciation | 48– |
| 15 | Fixed assets: intangible | 48– |
| 16 | Fixed assets: trade investments | 48– |
| 17 | Stocks and work in progress | 48– |
| 18 | Trade and other debtors | 48– |
| 19 | Marketable securities | 48– |
| 20 | Tax reserve certificates | 48– |
| 21 | Cash | 48– |

Continued on next page

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|-------------------------|---|------------------------|
| <i>Summary</i> | | |
| 22 | Total net assets | 48– |
| <i>Sources of funds</i> | | |
| 23 | Issue of shares: ordinary | 49– |
| 24 | Issue of shares: preference | 49– |
| 25 | Increase in liability to minority interests | 49–63 |
| 26 | Issue of long-term loans | 49– |
| 27 | Bank credit received | 49– |
| 28 | Trade and other credit received | 49– |
| 29 | Increase in dividend and interest liabilities | 49– |
| 30 | Increase in current tax liabilities | 49– |
| 31 | Increase in future tax reserves | 49– |
| 32 | Balance of profit: depreciation provision | 49– |

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|----------------------|---|------------------------|
| 33 | Balance of profit: provision for amortisation | 49–63 |
| 34 | Balance of profit: other provisions | 49–63 |
| 35 | Balance of profit: retained in reserves | 49– |
| 36 | Other receipts | 49– |
| <i>Uses of funds</i> | | |
| 37 | Expenditure, less receipts, on fixed assets: tangible | 49– |
| 38 | Expenditure, less receipts, on fixed assets: intangible | 49– |
| 39 | Expenditure, less receipts, on fixed assets: trade investments and subsidiaries | 49– |
| 40 | Increase in value of stocks and work in progress | 49– |
| 41 | Increase in credit given: trade and other debtors | 49– |
| 42 | Expenditure ex provisions | 49–63 |
| 43 | Sundry expenditure | 49– |
| <i>Adjustments</i> | | |

Continued on next page

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|----------------------------------|---|------------------------|
| 44 | Consolidation adjustment | 49— |
| 45 | Conversion adjustment | 49—63 |
| 46 | Residual adjustment | 49—63 |
| <i>Balance</i> | | |
| 47 | Change in securities | 49— |
| 48 | Change in tax reserve certificates | 49— |
| 49 | Change in cash | 49— |
| <i>Appropriability of income</i> | | |
| 50 | Operating profit (before depreciation) | 49— |
| 51 | Dividends and interest received (gross of income tax) | 49— |
| 52 | Other income | 49— |
| 53 | Interest paid on long-term liabilities gross | 49— |
| 54 | Tax on current profit | 49— |

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Continued on next page

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--------------------|--|------------------------|
| 55 | Dividend, ordinary | 49— |
| 56 | Dividend, other | 49— |
| 57 | To minority interests in subsidiaries, net of taxation | 49—63 |
| 58 | Prior year adjustments: tax | 49— |
| 59 | Prior year adjustments: general | 49— |
| <i>Summary</i> | | |
| 60 | Total capital and reserves | 48— |
| 61 | Total liabilities | 48— |
| 62 | Total fixed assets, net of depreciation | 48— |
| 63 | Total current assets | 48— |
| 64 | Total sources | 49— |
| 65 | Total uses | 49— |
| 66 | Total profit | 49— |

Continued on next page

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--------------------|--|------------------------|
| 67 | Total balance of profit | 49— |
| | <i>Expenditure on acquiring subsidiaries: considerations for subsidiaries acquired</i> | |
| 68 | Ordinary shares (acquiring subsidiaries) | 64— |
| 69 | Preference, etc. shares (acquiring subsidiaries) | 64— |
| 70 | Long-term loans (acquiring subsidiaries) | 64— |
| 71 | Cash (acquiring subsidiaries) | 64— |
| 72 | Previous holding added back | 64— |
| 73 | Total consideration | 64— |
| | <i>Excess payment</i> | |
| 74 | Number of companies: accounts analysed | 64— |
| 75 | Number of companies: accounts not analysed | 64— |
| | <i>Excess book value</i> | |
| 76 | Number of companies: accounts analysed | 64— |

Continued on next page

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--|--|------------------------|
| 77 | Number of companies: accounts not analysed | 64— |
| <i>Companies acquired: accounts analysed</i> | | |
| 78 | Number of companies acquired | 64— |
| 79 | Net tangible fixed assets | 64— |
| 80 | Goodwill, etc. | 64— |
| 81 | Investment | 64— |
| 82 | Current assets (excluding investments) | 64— |
| 83 | Unidentified assets | 64— |
| 84 | Less: minority interests | 64— |
| 85 | Deferred tax reserves | 64— |
| 86 | Long-term loans | 64— |
| 87 | Current liabilities | 64— |
| <i>Payment less book value</i> | | |

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--|-------------------------------------|------------------------|
| 88 | Excess payment | 64— |
| 89 | Excess book value | 64— |
| <i>Companies acquired: accounts not analysed</i> | | |
| 90 | Book value | 64— |
| 91 | Number of companies | 64— |
| <i>Payment less book value</i> | | |
| 92 | Excess payment | 64— |
| 93 | Excess book value | 64— |
| <i>Unconsolidated companies acquired</i> | | |
| 94 | Assumed book value | 64— |
| 95 | Number of companies | 64— |
| 96 | Proceeds from sales of subsidiaries | 64— |
| 97 | Amount written off subsidiaries | 64— |

Continued on next page

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--|--|------------------------|
| 98 | Further investment in subsidiaries | 64— |
| 99 | Upward revaluation of subsidiaries | 64— |
| <i>Investment grants</i> | | |
| 100 | Increase in investment grant reserve | 64— |
| 101 | Transfer to profit and loss account | 64— |
| 102 | Transfer to tax equalisation account | 64— |
| 103 | Direct credit to profit and loss | 64— |
| 104 | Amount deducted from fixed assets | 64— |
| 105 | Other treatments | 64— |
| 106 | Increase in investment grants due but unpaid | 64— |
| 107 | Investment grants received | 64— |
| <i>Miscellaneous extra information</i> | | |
| 108 | Investment grant reserve | 69— |

Continued on next page

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--------------------|--|------------------------|
| 109 | Asset replacement reserve | 69— |
| 110 | Pension fund | 69— |
| 111 | Tax equalisation reserve | 69— |
| 112 | Debentures and mortgages | 69— |
| 113 | Provisions | 69— |
| 114 | Land and buildings gross of depreciation | 64— |
| 115 | Plant, etc. gross of depreciation | 64— |
| 116 | Total gross tangible assets | 64— |
| 117 | Depreciation: land and buildings | 64— |
| 118 | Depreciation: plant, etc. | 64— |
| 119 | Cash paid for subsidiaries | 64— |
| 120 | Quoted investments | 69— |
| 121 | Market value of quoted investments | 69— |

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--------------------|---|------------------------|
| 122 | Income from quoted investments | 69— |
| 123 | Expenditure on hire of plant | 68— |
| 124 | Overseas tax on profits of year | 69— |
| 125 | Transfer to tax equalisation reserve and other deferred tax | 69— |
| 126 | Transfer to asset replacement reserve | 69— |
| 127 | Sales | 68— |
| 128 | Exports | 68— |
| 129 | Intangible assets: development and deferred revenue expenditure | 68— |
| 130 | Change in accumulated depreciation | 68— |
| 131 | Change in deferred tax reserve | 68— |
| 132 | Change in fixed assets due to revaluation | 68— |
| 133 | Change in fixed assets due to currency devaluation | 68— |
| 134 | Average number of employees | 68— |

Table 3.9: Cambridge-DTI dataset variables (Continued)

| Variable ID | Name | Years available |
|--------------------|--|------------------------|
| 135 | Employees remuneration | 68– |
| 136 | Total directors' pay | 68– |
| 137 | Chairman's pay | 69– |
| 138 | Highest paid director's pay | 69– |
| 139 | Directors in income band £0–2,500 | 69– |
| 140 | Directors in income band £2,501–5,000 | 69– |
| 141 | Directors in income band £5,001–7,500 | 69– |
| 142 | Directors in income band £7,501–10,000 | 69– |
| 143 | Directors in income band £10,001–20,000 | 69– |
| 144 | Directors in income band £20,001–30,000 | 69– |
| 145 | Directors in income band £30,001–40,000 | 69– |
| 146 | Directors in income band £40,001–50,000 | 69– |
| 147 | Directors in income band £50,000 and upwards | 69– |

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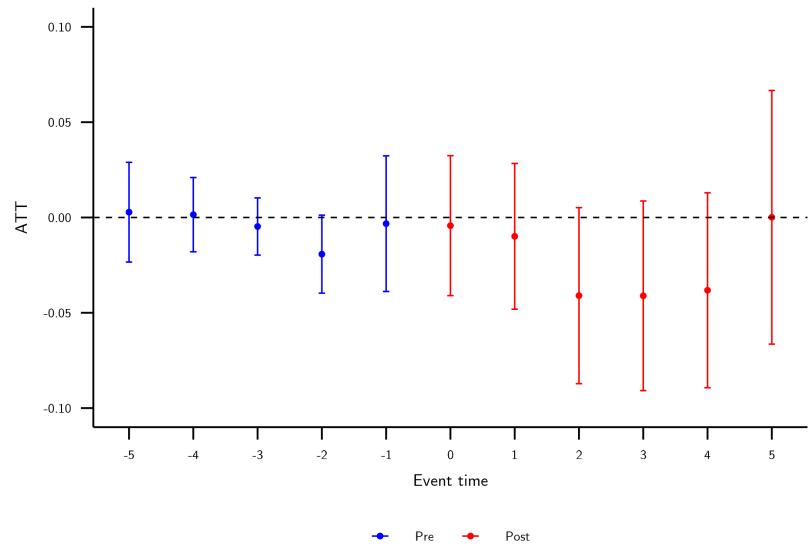
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Table 3.9: Cambridge-DTI dataset variables (Continued)

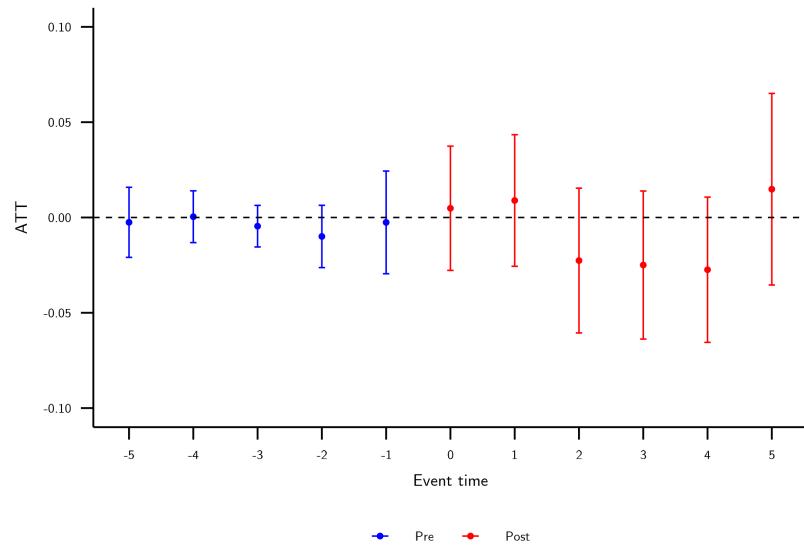
| Variable ID | Name | Years available |
|--------------------|---|------------------------|
| 148 | Schedule F payable | 1965 |
| 149 | Transitional tax relief: ordinary dividends | 1966 |
| 150 | Transitional tax relief: preference dividends | 1966 |

Additional Results

Below are the additional figures referenced in Sections 3.4.2. These figures use ROCE and ROE as the outcome variables, with and without the hi-tech control included. When these alternative financial ratios are used, the results remain consistent: there is no significant change to operating performance in IRC-sponsored firms following merger.

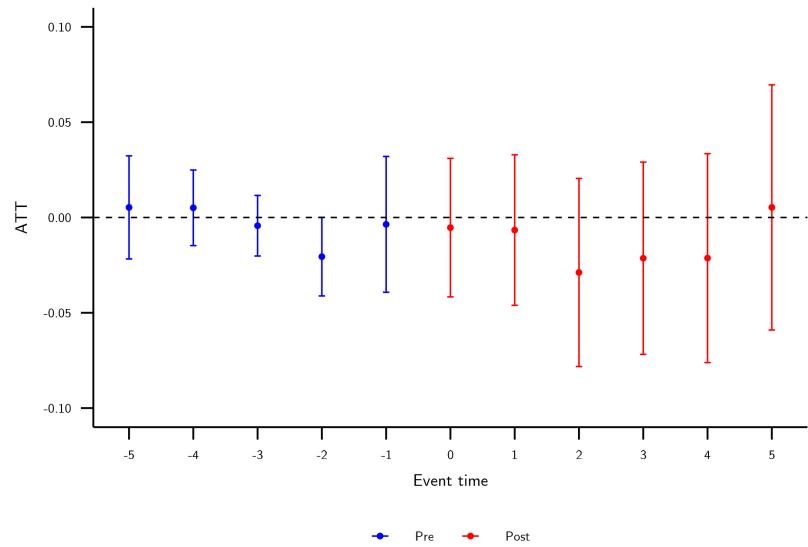


(a) Left: ROCE as outcome

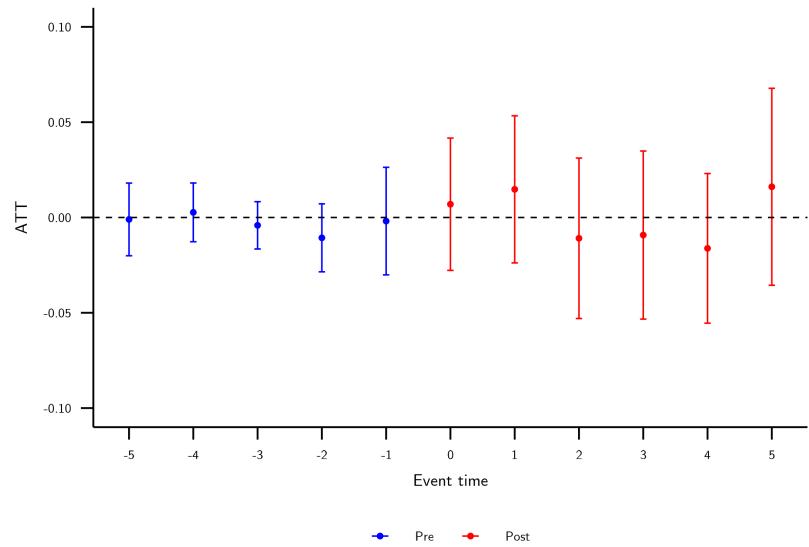


(b) Right: ROE as outcome

Figure 3.20: Operating performance: Additional difference-in-difference results



(a) Left: ROCE as outcome



(b) Right: ROE as outcome

Figure 3.21: Operating performance: Additional difference-in-difference results with hi-tech control

Variable Calculation

I provide equations for the variables used in the comparative analysis to non-IRC firms below. The variable IDs in the Cambridge-DTI dataset are provided, for ease of transparency and ease of reproducibility.

$$\text{Export Intensity}_{it} = \frac{\text{Exports}_{it}}{\text{Sales}_{it}} = \frac{\text{var128}_{it}}{\text{var127}_{it}}$$

$$\text{Asset Turnover}_{it} = \frac{\text{Sales}_{it}}{\text{Net Assets}_{it}} = \frac{\text{var127}_{it}}{\text{var22}_{it}}$$

$$\text{Operating Margin}_{it} = \frac{\text{Pre-Tax Profits}_{it}}{\text{Sales}_{it}} = \frac{\text{ptprof}_{it}}{\text{var127}_{it}}$$

$$\text{Employees-to-Sales Ratio}_{it} = \frac{\text{Average Employment}_{it}}{\text{Sales}_{it}} = \frac{\text{var134}_{it}}{\text{var127}_{it}}$$

$$\text{Growth of Net Assets}_{it} = \text{Internal Growth}_{it} + \text{External Growth}_{it}$$

$$\text{InternalROG}_{it} = \frac{1}{\text{var22}_{it-1}} \left[(\text{var37}_{it} - \text{var32}_{it} - \text{var33}_{it}) + (\text{var38}_{it} + \text{var40}_{it} + \text{var41}_{it} + \text{var42}_{it} + \text{var43}_{it} + \text{var44}_{it} + \text{var45}_{it} + \text{var46}_{it} + \text{var47}_{it} + \text{var48}_{it} + \text{var49}_{it} - \text{var27}_{it} - \text{var28}_{it} - \text{var29}_{it} - \text{var30}_{it}) \right]$$

$$\text{ExternalROG}_{it} = \frac{\text{var39}_{it} + ((\text{var7}_{it} + \text{var8}_{it}) + (\text{var7}_{i,t-1} + \text{var8}_{i,t-1}) - \text{var26}_{it})}{\text{var22}_{it-1}}$$

BIBLIOGRAPHY

ARCHIVAL SOURCES

- Bristol Archives: 38169/A/2/14/ (1957). Papers relating to the merger of the Mitchell and Wills Branches.
- Bristol Archives: 38169/Ad/GC/12 (1960, 1963, 1965–76). Kensitas.
- Bristol Archives: 38169/Ad/GC/13 (1958–70). A collection of circulars, leaflets, bonus documents etc relating to the above catalogues c1958 - 1970.
- Bristol Archives: 38169/HAF/6/46 (1961). Firms: J Wix Sons Ltd: original letter re Gallaher's acquisition of Wix 1961.
- Bristol Archives: 38169/Pr/7/4 (1951–56). 'The Smokers' Handbook': manufacturers' retail price lists issued by 'Tobacco', the tobacconists' trade journal.
- Bristol Archives: 38169/Pr/7/5 (1957–60). 'The Smokers' Handbook': manufacturers' retail price lists issued by 'Tobacco', the tobacconists' trade journal.
- Bristol Archives: 38169/Pr/7/6 (1961–65). 'The Smokers' Handbook': manufacturers' retail price lists issued by 'Tobacco', the tobacconists' trade journal.
- The National Archives: BT 213/407 (1966). Economic Research Unit: research into competition.
- The National Archives: BT 258/1203 (1961). Monopolies and restrictive practices: review of legislation; general papers.
- The National Archives: BT 258/1949 (1962). Serial set of papers: MRPR(62).
- The National Archives: BT 64/5196 (1960–62). Restrictive Trade Practices Act 1956: proposals by The Federation of British Industries for revision.
- The National Archives: BT 64/5223 (1961). Prime Minister's minute to President of the Board of Trade on restrictive practices.
- The National Archives: CAB 147/100 (1965–66). Industrial Reorganisation Corporation.
- The National Archives: CAB 147/95 (1965–67). Monopolies mergers and restrictive practices.
- The National Archives: CAB 164/365 (3 January 1966–27 November 1968). Government stimulation of technological innovation.
- The National Archives: EW 27/238 (1966–67). Industrial Reorganisation Corporation: industrial studies and investigations.
- The National Archives: IR 40/14187 (1961–65). Following report of Monopolies Commission Imperial Tobacco Company consult the Revenue in dealing with its Gallaher holdings.
- The National Archives: PREM 11/4027 (1961–62). Discussions on Monopolies Commission report on Imperial Tobacco Co, Ltd.
- The National Archives: PREM 13/2363 (1 May 1966–31 August 1968). SCIENCE AND TECHNOLOGY. Professor Blackett wrote to Prime Minister on arrangements for high-level science planning: report of working party on research and development; report on technical innovation in UK.
- The National Archives: T 233/1127 (1955). Increase in price of Imperial Tobacco Company's cigarettes: effect on tobacco revenue.

PARLIAMENTARY DEBATES

- Allaun, F. (1956). Speech in House of Commons Debates, vol. 552, col. 578 (3 May 1956). Hansard, House of Commons.
- Bacon, A. (1956). Speech in House of Commons Debates, vol. 556, col. 1027 (17 July 1956). Hansard, House of Commons.

- Castle, B. (1964). Speech in House of Commons Debates, vol. 698, col. 70 (6 July 1964). Hansard, House of Commons.
- de Ferranti, B. (1960). Speech in House of Commons Debates, vol. 629, cols. 282 and 285 (2 November 1960). Hansard, House of Commons.
- Erroll, F. (1962). Speech in House of Commons Debates, vol. 655, col. 1513 (15 March 1962). Hansard, House of Commons.
- Jay, D. (1956a). Speech in House of Commons Debates, vol. 549, col. 1956 (6 March 1956). Hansard, House of Commons.
- Jay, D. (1956b). Speech in House of Commons Debates, vol. 552, col. 455 (2 May 1956). Hansard, House of Commons.
- Jay, D. (1962). Speech in House of Commons Debates, vol. 653, col. 1324 (14 February 1962). Hansard, House of Commons.
- Jenkins, R. (1956). Speech in House of Commons Debates, vol. 552, col. 636 (3 May 1956). Hansard, House of Commons.
- Leather, E. H. C. (1951). Speech in House of Commons Debates, vol. 488, cols. 2725–6 (15 June 1951). Hansard, House of Commons.
- Plummer, L. (1956). Speech in house of commons debates, vol. 552, cols. 477–478 (2 may 1956). Hansard, House of Commons.
- Shawcross, H. (1951). Speech in House of Commons Debates, vol. 488, col. 2746 (15 June 1951). Hansard, House of Commons.
- Thompson, K. (1956). Speech in House of Commons Debates, vol. 552, col. 578 (3 May 1956). Hansard, House of Commons.
- Thorneycroft, P. (1956). Speech in House of Commons Debates, vol. 549, col. 1943 (6 March 1956). Hansard, House of Commons.
- Wilson, H. (1951). Speech in House of Commons Debates, vol. 488, col. 2765 (15 June 1951). Hansard, House of Commons.

PERIODICALS

- The Daily Mail (1961).
- The Daily Mirror (1955).
- The Daily Telegraph (1955).
- The Economist (various).
- The Financial Times (various).
- The Guardian (2025).
- The Spectator (1956).
- The Sunday Times (1955).
- The Times (various).

OFFICIAL PUBLICATIONS

- Board of Trade (1967). Annual Report on the Operation of the Monopolies and Mergers Acts, 1966. House of Commons Papers, 1966–67, Paper no. 345.
- Board of Trade (1967 - 1970). *Report on the census of production for 1963. 1-133.* H.M.S.O, London.
- Bolton, J. E., of Trade, G. B. D., and Industry. (1971). *Small firms : report of the Committee of Inquiry on Small Firms.* Cmnd ; 4811. H.M.S.O., London.

- Business Statistics Office (1979). *Statistics of Product Concentration of UK Manufacturers for 1963, 1968 and 1975*. H.M.S.O., London.
- Cardell, S. (2024). Driving Growth: How the CMA is Rising to the Challenge. <https://www.gov.uk/government/speeches/driving-growth-how-the-cma-is-rising-to-the-challenge>. Speech at Chatham House Competition Policy Conference.
- Central Statistics Office (1973). *Research and Development Expenditure / Central Statistical Office. Studies in Official Statistics*; no.21. HMSO, London.
- Committee on Company Law Amendment (1945). Report of the Committee on Company Law Amendment. Technical Report Cmd 6659, His Majesty's Stationery Office, London. (Cohen Report).
- Competition and Markets Authority (2024). CMA response to Industrial Strategy Green Paper. <https://www.gov.uk/government/publications/cma-response-to-industrial-strategy-green-paper>. Response to the UK's Industrial Strategy Green Paper (Invest 2035).
- Competition and Markets Authority (2025a). How we investigated the Vodafone/Three merger: Final outcome and undertakings. <https://www.gov.uk/guidance/how-we-are-investigating-the-vodafone-three-potential-merger>.
- Competition and Markets Authority (2025b). New CMA proposals to drive growth, investment and business confidence. <https://competitionandmarkets.blog.gov.uk/2025/02/13/new-cma-proposals-to-drive-growth-investment-and-business-confidence/>.
- Department for Business and Trade (2024). Invest 2035: the UK's Modern Industrial Strategy (Consultation). <https://www.gov.uk/government/consultations/invest-2035-the-uks-modern-industrial-strategy/invest-2035-the-uks-modern-industrial-strategy>. Green Paper, UK Government.
- Department of Trade and Industry (1971 - 1972). *Report on the census of production for 1968. 1-171*. H.M.S.O, London.
- Draghi, M. (2024a). The Future of European Competitiveness: A Competitiveness Strategy for Europe. Report, European Commission. Part A: Strategy document.
- Draghi, M. (2024b). The Future of European Competitiveness: In-depth Analysis and Recommendations. Report, European Commission. Part B: In-depth analysis.
- HM Government (1966). Industrial Reorganisation Corporation. Command Paper, Cmnd. 2889, House of Commons Papers, 1965–66, vol. 13, p. XIII.171.
- House of Commons (1970). Termination of IRC and Expansion Act Bill. House of Commons Papers, Bill 80, ordered to be printed 17 December 1970.
- House of Commons (1971). Termination of IRC and Expansion Act Bill [as amended by Standing Committee E]. House of Commons Papers, Bill 92, ordered to be printed 18 February 1971.
- Industrial Reorganisation Corporation (1968). First Report and Accounts for the Period December 1966 to March 1968. House of Commons Papers, 1967–68, Paper no. 252, vol. 24, p. XXIV.13.
- Industrial Reorganisation Corporation (1969). Report and Accounts for the Year Ended 31st March 1969. House of Commons Papers, 1968–69, Paper no. 286, vol. 33, p. XXXIII.969.
- Industrial Reorganisation Corporation (1970). Report and Accounts for the Year Ended 31st March 1970. House of Commons Papers, 1969–70, Paper no. 310, vol. 16, p. XVI.41.
- Industrial Reorganisation Corporation (1971). Report and Accounts for the Year Ended 31st March 1971. House of Commons Papers, 1970–71.
- Monopolies Commission (1961). Report on the Supply of Cigarettes and Tobacco and of Cigarette and Tobacco Machinery. Technical Report Cmnd. 218, Her Majesty's Stationery Office, London. Presented to Parliament in pursuance of Section 9 of the Monopolies and Restrictive Practices (Inquiry and Control) Act, 1948.

Monopolies Commission (1966). Ross Group Limited and Associated Fisheries Limited: A Report on the Proposed Merger. Presented to Parliament in pursuance of section 9 of the Monopolies and Restrictive Practices (Inquiry and Control) Act 1948, as applied by section 6(5) of the Monopolies and Mergers Act 1965.

OECD (1970). *Frascati Manual 1970: Proposed Standard Practice for Surveys of Research and Experimental Development*. OECD Publishing, Paris.

Penrose, J. (2021). Power to the People: Stronger Consumer Choice and Competition So Markets Work for People, Not the Other Way Around. An independent report presented to Her Majesty's Government.

Starmer, K. (2024). PM International Investment Summit Speech: 14 October 2024. <https://www.gov.uk/government/speeches/pm-international-investment-summit-speech-14-october-2024>. Speech at the International Investment Summit, London.

The Royal Swedish Academy of Sciences (2025). Press release: The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2025. <https://www.nobelprize.org/prizes/economic-sciences/2025/press-release/>.

United Kingdom. Monopolies and Restrictive Practices Commission (1955). Collective Discrimination: A Report on Exclusive Dealing, Collective Boycotts, Aggregated Rebates and Other Discriminatory Trade Practices.

SECONDARY LITERATURE

(2014). 'Dynamic, Exciting, Thrilling Change' the Wilson Government's Economic Policies, 1964–70, author=O'Hara, Glen. In *The Wilson Governments 1964–1970 Reconsidered*, pages 79–98. Routledge.

Aaronovitch, S. and Sawyer, M. C. (1975a). *Big business: theoretical and empirical aspects of concentration and mergers in the United Kingdom*. Macmillan London.

Aaronovitch, S. and Sawyer, M. C. (1975b). Mergers, growth, and concentration. *Oxford Economic Papers*, 27(1):136–155.

Aasved, M. J. (1996). The sirens and cargo cults. *The Classical World*, pages 383–392.

Acemoglu, D., Aghion, P., and Zilibotti, F. (2006). Distance to frontier, selection, and economic growth. *Journal of the European Economic Association*, 4(1):37–74.

Acs, Z. J. and Audretsch, D. B. (1987). Innovation, market structure, and firm size. *The Review of Economics and Statistics*, pages 567–574.

Adhikari, D. R. (2004). Measuring market power of the US cigarette industry. *Applied Economics Letters*, 11(15):957–959.

Aghion, P., Akcigit, U., and Howitt, P. (2015a). The Schumpeterian growth paradigm. *Annual Review of Economics*, 7(1):557–575.

Aghion, P., Angeletos, G., Banerjee, A., and Manova, K. (2010). Volatility and growth: Credit constraints and the composition of investment. *Journal of Monetary Economics*, 57(3):246–265.

Aghion, P., Bloom, N., Blundell, R., Griffith, R., and Howitt, P. (2005). Competition and innovation: An inverted-u relationship. *The Quarterly Journal of Economics*, 120(2):701–728.

Aghion, P., Cai, J., Dewatripont, M., Du, L., Harrison, A., and Legros, P. (2015b). Industrial policy and competition. *American Economic Journal: Macroeconomics*, 7(4):1–32.

Aghion, P. and Howitt, P. (1992). A model of growth through creative destruction. *Econometrica*, 60(2):323–351.

Aghion, P., Howitt, P., Brant-Collett, M., and García-Péñalosa, C. (1998). *Endogenous growth theory*. MIT Press.

Ahn, S. (2002). Competition, innovation and productivity growth: a review of theory and evidence. Available at SSRN 318059.

- Aiginger, K. and Rodrik, D. (2020). Rebirth of industrial policy and an agenda for the twenty-first century. *Journal of Industry, Competition and Trade*, 20(2):189–207.
- Albæk, S., Møllgaard, P., and Overgaard, P. B. (1997). Government-assisted oligopoly coordination? A concrete case. *The Journal of Industrial Economics*, 45(4):429–443.
- Alesina, A., Cohen, G. D., and Roubini, N. (1993). Electoral business cycle in industrial democracies. *European Journal of Political Economy*, 9(1):1–23.
- Alford, B. (1995). *British economic performance 1945–1975*, volume 4. Cambridge University Press.
- Alford, B. W. E. (1973). *WD & HO Wills and the Development of the UK Tobacco Industry: 1786–1965*. Methuen, London.
- Ali, N., Jaffar, A., Anwer, M., Raza, D. M., and Ali, N. (2015). The economic analysis of tobacco industry: a case study of tobacco production in Pakistan. *International Journal of Research (IJR)*, 2(3).
- Aminikhaghahi, S. and Cook, D. J. (2017). A survey of methods for time series change point detection. *Knowledge and Information Systems*, 51(2):339–367.
- Andrade, G., Mitchell, M., and Stafford, E. (2001). New evidence and perspectives on mergers. *Journal of Economic Perspectives*, 15(2):103–120.
- A&O Shearman (2025). A (provisionally) more flexible approach? CMA consults on revised merger remedies guidance. <https://www.aoshearman.com/en/insights/a-provisionally-more-flexible-approach-cma-consults-on-revised-merger-remedies-guidance>.
- Arrow, K. J. (1962). Economic welfare and the allocation of resources for invention. In Nelson, R. R., editor, *The Rate and Direction of Inventive Activity: Economic and Social Factors*, pages 609–626. Princeton University Press, Princeton, NJ. Accessed 6 Oct. 2025.
- Ashenfelter, O. and Hosken, D. (2010). The effect of mergers on consumer prices: Evidence from five mergers on the enforcement margin. *The Journal of Law Economics*, 53(3):417–466.
- Ashton, J. (2017). Uk competition judgements 1950–2005. Data collection, UK Data Archive – UK Data Service. DOI: 10.5255/UKDA-SN-851467; Temporal coverage: 1 Jan 1950–31 Dec 2005; United Kingdom.
- Asquith, P. (1983). Merger bids, uncertainty, and stockholder returns. *Journal of Financial Economics*, 11(1-4):51–83.
- Bacon, R. and Eltis, W. (1974). *The age of US and UK machinery*. National Economic Development Office.
- Bagwell, K. (2007). The economic analysis of advertising. *Handbook of Industrial Organization*, 3:1701–1844.
- Baker, J. and Viñas Llovet, N. (2025). Tough on mergers, or just misunderstood? Reappraising the CMA's reputation. <https://www.frontier-economics.com/uk/en/news-and-insights/articles/article-i21715-tough-on-mergers-or-just-misunderstood-reappraising-the-cmas-reputation/>.
- Baker, J. B. (2005). Competition policy as a political bargain. *Antitrust LJ*, 73:483.
- Baker, J. B. and Farrell, J. (2020). Oligopoly coordination, economic analysis, and the prophylactic role of horizontal merger enforcement. *University of Pennsylvania Law Review*, 168(7):1985–2018.
- Bakker, G. (2005). The Decline and Fall of the European Film Industry: Sunk Costs, Market Size and Market Structure, 1895–1926. *Economic History Review*, 58(2):310–351.
- Bakker, G. (2018). Innovation and technical change. In Colvin, C. and Blum, M., editors, *An Economist's Guide to Economic History*, pages 211–222. Palgrave Macmillan.
- Baldwin, R. E. and Robert-Nicoud, F. (2007). Entry and asymmetric lobbying: why governments pick losers. *Journal of the European Economic Association*, 5(5):1064–1093.
- Baran, P. A. and Sweezy, P. M. (1966). *Monopoly Capital: An Essay on the American Economic and Social Order*. Monthly Review Press, New York.
- Barnett, P. G., Keeler, T. E., and Hu, T.-w. (1995). Oligopoly structure and the incidence of cigarette excise taxes. *Journal of Public Economics*, 57(3):457–470.

- Bartelsman, E. J., Haltiwanger, J., and Scarpetta, S. (2004). Microeconomic evidence of creative destruction in industrial and developing countries. Technical report, IZA Discussion Papers.
- Batchelor, B., Luoma, A., and Antoniou, I. (2024). CMA's Growth Agenda: UK Competition Authority May Loosen Position on Merger Remedies. /url.
- Beer, J. (1958). Coal tar dye manufacture and the origins of the modern industrial research laboratory. *Isis*, 49(2):123–131.
- Beesley, M. E. and White, G. M. (1973). The industrial reorganization corporation: A study in choice of public management. *Public Administration*, 51(2):125–139.
- Bena, J. and Li, K. (2014). Corporate innovations and mergers and acquisitions. *The Journal of Finance*, 69(5):1923–1960.
- Bernal, J. L., Cummins, S., and Gasparrini, A. (2017). Interrupted time series regression for the evaluation of public health interventions: a tutorial. *International Journal of Epidemiology*, 46(1):348–355.
- Bertrand, O. (2009). Effects of foreign acquisitions on R&D activity: Evidence from firm-level data for France. *Research Policy*, 38(6):1021–1031.
- Betas, T. et al. (2016). From the tobacco shop to the cigarette factory: technological changes, gender and surveillance in a Greek cigarette firm in the early 20th century. *Advances in Historical Studies*, 5(02):49.
- Bianchi, P. and Labory, S. (2011). Industrial policy after the crisis: seizing the future. In *Industrial Policy after the Crisis*. Edward Elgar Publishing.
- Billington, S. D., Colvin, C. L., and Coyle, C. (2025). Financing innovation: The role of patent examination.
- Blonigen, B. A. and Taylor, C. T. (2000). R&D intensity and acquisitions in high-technology industries: evidence from the US electronic and electrical equipment industries. *The Journal of Industrial Economics*, 48(1):47–70.
- Blundell, R., Griffith, R., and Van Reenen, J. (1999). Market share, market value and innovation in a panel of British manufacturing firms. *The Review of Economic Studies*, 66(3):529–554.
- Bonaimé, A. and Wang, Y. E. (2024). Mergers, product prices, and innovation: Evidence from the pharmaceutical industry. *The Journal of Finance*, 79(3):2195–2236.
- Bonnet, C. and Philip Schain, J. (2020). An empirical analysis of mergers: Efficiency gains and impact on consumer prices. *Journal of Competition Law & Economics*, 16(1):1–35.
- Booker, C. (1970). *The Neophiliacs: A Study of the Revolution in English Life in the Fifties and Sixties*. Fontana / Collins, London.
- Booth, A. (2003a). The Broadberry-Crafts view and the evidence: a reply. *The Economic History Review*, 56(4):736–742.
- Booth, A. (2003b). The manufacturing failure hypothesis and the performance of British industry during the long boom. *Economic History Review*, pages 1–33.
- Booth, A. (2017). *The British economy in the twentieth century*. Bloomsbury Publishing.
- Box, G. E. P. and Cox, D. R. (1964). An analysis of transformations. *Journal of the Royal Statistical Society: Series B (Methodological)*, 26(2):211–252.
- Broadberry, S. and Crafts, N. (2001). Competition and innovation in 1950s Britain. *Business History*, 43(1):97–118.
- Broadberry, S. and Crafts, N. (2003). UK productivity performance from 1950 to 1979: a restatement of the Broadberry-Crafts view. *The Economic History Review*, 56(4):718–735.
- Broadberry, S. N. and Crafts, N. F. (1996). British economic policy and industrial performance in the early post-war period. *Business History*, 38(4):65–91.
- Brown, S. J. and Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics*, 14(1):3–31.

- Buccirossi, P., Ciari, L., Duso, T., Spagnolo, G., and Vitale, C. (2013). Competition policy and productivity growth: An empirical assessment. *Review of Economics and Statistics*, 95(4):1324–1336.
- Budge, I. (1993). Relative decline as a political issue: Ideological motivations of the politico-economic debate in post-war Britain. *Contemporary British History*, 7(1):1–23.
- Burns, M. R. (1983). Economies of scale in tobacco manufacture, 1897–1910. *The Journal of Economic History*, 43(2):461–474.
- Büthe, T. and Cheng, C. (2017). The effect of competition law on innovation: A cross-national statistical analysis. In *A step ahead: Competition policy for shared prosperity and inclusive growth*, pages 205–224. World Bank and OECD Washington, DC.
- Callaway, B. and Sant'Anna, P. H. (2021). Difference-in-differences with multiple time periods. *Journal of Econometrics*, 225(2):200–230.
- Caves, R. E. (1968). Market organisation, performance and public policy. In Caves, R., editor, *Britain's Economic Prospects*.
- Cefis, E. and Marsili, O. (2015). Crossing the innovation threshold through mergers and acquisitions. *Research Policy*, 44(3):698–710.
- Chamberlain, C. E. (2024). *British Attitudes to the German Economic Miracle, 1948 to Circa 1971*. Phd dissertation, University of Cambridge, United Kingdom.
- Chandler, A. (2009). *Scale and scope: The dynamics of industrial capitalism*. Harvard University Press.
- Chandler Jr., A. D. (1993). *The visible hand*. Harvard University Press.
- Chang, H.-J. and Andreoni, A. (2020). Industrial policy in the 21st century. *Development and change*, 51(2):324–351.
- Clarke, J. L. and Evenett, S. J. (2003). The deterrent effects of national antitrust laws: evidence from the international vitamins cartel. *The Antitrust Bulletin*, 48(3):689–726.
- Clarke, R. (1991). *Industrial economics*. Wiley-Blackwell.
- Clayton, D. (2010). Advertising Expenditure in 1950s Britain. *Business History*, 52(1):60–75.
- Clougherty, J. A. (2010). Competition policy trends and economic growth: Cross-national empirical evidence. *International Journal of the Economics of Business*, 17(1):111–127.
- Cohen, W. and Levin, R. (1989). Empirical studies of innovation and market structure. In *Handbook of Industrial Organization*, volume 2, pages 1059–1107.
- Comanor, W. S. (1967). Market structure, product differentiation, and industrial research. *The Quarterly Journal of Economics*, 81(4):639–657.
- Connor, J. M. (2001). “Our customers are our enemies”: the lysine cartel of 1992–1995. *Review of Industrial Organization*, 18(1):5–21.
- Cook, R. D. (1977). Detection of influential observation in linear regression. *Technometrics*, 19(1):15–18.
- Cooper, C. (2011). Little local difficulties revisited: Peter Thorneycroft, the 1958 Treasury resignations and the origins of Thatcherism. *Contemporary British History*, 25(2):227–250.
- Corina, M. (1975). *Trust in Tobacco: The Anglo-American Struggle for Power*. St. Martin's Press, New York.
- Cowling, K. (1982). *Monopoly Capitalism*. Macmillan, London.
- Cox, H. (2000). *The global cigarette: Origins and evolution of British American Tobacco, 1880–1945*. Oxford University Press.
- Crafts, N. (1991). Reversing relative economic decline? the 1980s in historical perspective. *Oxford Review of Economic Policy*, 7(3):81–98.
- Crafts, N. (1998). Forging ahead and falling behind: the rise and relative decline of the first industrial nation. *Journal of Economic Perspectives*, 12(2):193–210.

- Crafts, N. (2012). British relative economic decline revisited: The role of competition. *Explorations in Economic History*, 49(1):17–29.
- Crafts, N. (2017). The Postwar British Productivity Failure. Technical Report 350, University of Warwick, Centre for Competitive Advantage in the Global Economy (CAGE), Coventry, UK. CAGE Working Paper.
- Crafts, N. (2018). *Forging Ahead, Falling Behind and Fighting Back: British Economic Growth from the Industrial Revolution to the Financial Crisis*. Cambridge University Press.
- Crafts, N. and Mills, T. C. (2005). TFP growth in British and German manufacturing, 1950–1996. *The Economic Journal*, 115(505):649–670.
- Crafts, N. and Toniolo, G. (2008). *European economic growth, 1950–2005: an overview*. Centre for Economic Policy Research, London.
- Crane, D. A. (2018). Antitrust's unconventional politics. *Virginia Law Review Online*, 104:118.
- Croslan, A. (1956). *The Future of Socialism*. Jonathan Cape, London.
- Cumming, D., Jindal, V., Kumar, S., and Pandey, N. (2023). Mergers and acquisitions research in finance and accounting: Past, present, and future. *European Financial Management*, 29(5):1464–1504.
- Cunningham, C., Ederer, F., and Ma, S. (2021). Killer acquisitions. *Journal of Political Economy*, 129(3):649–702.
- Davies, S., Ormosi, P. L., and Graffenberger, M. (2015). Mergers after cartels: How markets react to cartel breakdown. *The Journal of Law and Economics*, 58(3):561–583.
- De Loecker, J., Eeckhout, J., and Unger, G. (2020). The rise of market power and the macroeconomic implications. *The Quarterly Journal of Economics*, 135(2):561–644.
- DeCicca, P., Kenkel, D., and Lovenheim, M. F. (2022). The economics of tobacco regulation: a comprehensive review. *Journal of Economic Literature*, 60(3):883–970.
- Denicolò, V. and Polo, M. (2018). Duplicative research, mergers and innovation. *Economics Letters*, 166:56–59.
- Denstadli, J. M., Lines, R., and Grønhaug, K. (2005). First mover advantages in the discount grocery industry. *European Journal of Marketing*, 39(7/8):872–884.
- Dentons (2025). The ‘pro-growth’ CMA changes tack on merger control. <https://www.dentons.com/en/insights/articles/2025/february/18/the-pro-growth-cma-changes-tack-on-merger-control>.
- Dessí, R. and Robertson, D. (2003). Debt, incentives and performance: Evidence from uk panel data. *The Economic Journal*, 113(490):903–919.
- Desyllas, P. and Hughes, A. (2010). Do high technology acquirers become more innovative? *Research Policy*, 39(8):1105–1121.
- Dewhurst, T. and Davis, B. (2005). Brand strategy and integrated marketing communication (IMC): A case study of Player’s cigarette brand marketing. *Journal of Advertising*, 34(4):81–92.
- Dezi, L., Battisti, E., Ferraris, A., and Papa, A. (2018). The link between mergers and acquisitions and innovation: A systematic literature review. *Management Research Review*, 41(6):716–752.
- Diamantoudi, E. (2005). Stable cartels revisited. *Economic Theory*, 26(4):907–921.
- Dimson, E., Nagel, S., Quigley, G., and Advisors, D. F. (2001). Value versus Growth in the UK Stock Market, 1955 to 2000. *London Business School, Working Paper*.
- Djankov, S., La Porta, R., Lopez-de Silanes, F., and Shleifer, A. (2002). The regulation of entry. *The Quarterly Journal of Economics*, 117(1):1–37.
- Dodd, P. (1980). Merger proposals, management discretion and stockholder wealth. *Journal of Financial Economics*, 8(2):105–137.

- Dorsett, M. R. (2005). Diamonds are a Cartel's Best Friend: The Rise and Fall of Anticompetitive Business Practices within De Beer's International Diamond Cartel. *Ind. Int'l & Compar. L. Rev.*, 16:145.
- Dow, J. C. R. (1970). *The Management of the British Economy 1945-60*. Cambridge University Press, Cambridge.
- Drazen, A. (2000). *Political Economy in Macroeconomics*. Princeton University Press, Princeton.
- Dutz, M. A. and Vagliasindi, M. (2000). Competition policy implementation in transition economies: an empirical assessment. *European Economic Review*, 44(4-6):762–772.
- Eckard Jr, E. W. (1991). Competition and the cigarette tv advertising ban. *Economic Inquiry*, 29(1):119–133.
- Eckbo, B. E. (1983). Horizontal mergers, collusion, and stockholder wealth. *Journal of Financial Economics*, 11(1-4):241–273.
- Edwards, R. and Gandy, A. (2019). The Industrial Reorganisation Corporation and the 1968 reorganisation of British manufacturing. <https://history.blog.gov.uk/2019/06/17/the-industrial-reorganisation-corporation-and-the-1968-reorganisation-of-british-manufacturing/>. Blog post, History of Government (GOV.UK).
- Efron, B. and Tibshirani, R. J. (1994). *An Introduction to the Bootstrap*. Chapman & Hall/CRC.
- Egerton-Doyle, V. (2020). The Phase 2 deal mortality meter: there's more to death than prohibition. <https://www.linklaters.com/en/insights/publications/platypus/platypus-uk-merger-control-analysis/third-platypus-post---the-phase-2-deal-mortality-meter-theres-more-to-death-than-prohibition>. Linklaters' Platypus Blog.
- Elbaum, B. and Lazonick, W. (1984). The decline of the British economy: An institutional perspective. *The Journal of Economic History*, 44(2):567–583.
- Elliott, D. C. and Gribbin, J. D. (1977). The abolition of cartels and structural change in the United Kingdom. In *Welfare aspects of industrial markets*, pages 345–365. Springer.
- Ellis, J. (1998). Cartels in the Coal Industry on Tyneside, 1699–1750. *Northern History*, 34(1):134–148.
- Ellison, G. (1994). Theories of cartel stability and the joint executive committee. *The RAND Journal of Economics*, pages 37–57.
- Eltis, W. (1979). How rapid public sector growth can undermine the growth of the national product. In *Slow Growth in Britain: Causes and Consequences*, pages 118–139. Oxford.
- English, R. and Kenny, M. (1999). British decline or the politics of declinism? *The British Journal of Politics and International Relations*, 1(2):252–266.
- Enstad, N. (2019). *Cigarettes, Inc. An intimate history of corporate imperialism*. University of Chicago Press.
- Erhard, L. (1958). *Prosperity Through Competition*. Books That matter. Praeger.
- Faccio, M. (2006). Politically connected firms. *American Economic Review*, 96(1):369–386.
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2):383–417.
- Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, 49(3):283–306.
- Farrell, J. and Shapiro, C. (1990). Horizontal mergers: An equilibrium analysis. *The American Economic Review*, 80(1):107–126.
- Farrell, J. and Shapiro, C. (2010). Antitrust evaluation of horizontal mergers: An economic alternative to market definition. Available at SSRN 1313782.
- Federation of British Industries (1955). Restrictive Business Practices and the Public Interest. A Statement by the Federation of British Industries. Pamphlet.

- Federico, G., Langus, G., and Valletti, T. (2017). A simple model of mergers and innovation. *Economics Letters*, 157:136–140.
- Feldenkirchen, W. (1992). Competition policy in Germany. *Business and Economic History*, pages 257–269.
- Ferguson, P. R. and Ferguson, G. J. (1994). The structure-conduct-performance paradigm. In *Industrial economics*, pages 13–37. Springer.
- Fisher, F. and Temin, P. (1973). Returns to scale in research and development: What does the Schumpeterian hypothesis imply? *Journal of Political Economy*, 81(1):56–70.
- Fisher, F. and Temin, P. (1979). The Schumpeterian Hypothesis: Reply. *Journal of Political Economy*, 87(2):386–389.
- Fitzgerald, R. (1995). *Rowntree and the marketing revolution, 1862–1969*. Cambridge University Press.
- Ford, J. and Egerton-Doyle, V. (2023). Three years of Platypus, and five suggestions to improve Phase 2. <https://www.linklaters.com/en/insights/publications/platypus/platypus-uk-merger-control-analysis/eighteenth-platypus-post---three-years-of-platypus-and-five-suggestions-to-improve-phase-2>. Linklaters' Platypus Blog.
- Fourie, F. and Smith, A. (1994). The South African cement cartel: An economic evaluation. *South African Journal of Economics*, 62(2):123–143.
- Franks, J. R. and Harris, R. S. (1989). Shareholder wealth effects of corporate takeovers: The U.K. experience 1955–1985. *Journal of Financial Economics*, 23(2):225–249.
- Freedman, D. and Diaconis, P. (1981). On the histogram as a density estimator: l_2 theory. *Zeitschrift für Wahrscheinlichkeitstheorie und Verwandte Gebiete*, 57(4):453–476.
- Fridson, M. S. and Alvarez, F. (2022). *Financial statement analysis: a practitioner's guide*. John Wiley & Sons.
- Friedman, J. W. (1971). A non-cooperative equilibrium for supergames. *The Review of Economic Studies*, 38(1):1–12.
- Galbraith, J. (1952). *American Capitalism, the concept of countervailing power*. Houghton Mifflin, Boston.
- Galbraith, J. K. (1967). *The New Industrial State*. Houghton Mifflin, Boston.
- Gandy, A. and Edwards, R. (2019). Enterprise vs. product logic: the industrial reorganisation corporation and the rationalisation of the British electrical/electronics industry. *Business History*, 61(7):1236–1257.
- Garrod, L., Harrington Jr, J. E., and Olczak, M. (2021). *Hub-and-spoke cartels: Why they form, how they operate, and how to prosecute them*. MIT Press.
- Genesove, D. and Mullin, W. P. (1998). Testing static oligopoly models: conduct and cost in the sugar industry, 1890–1914. *The RAND Journal of Economics*, pages 355–377.
- Genesove, D. and Mullin, W. P. (1999). The Sugar Industry Learns to Organize Information Exchange. In Lamoreaux, N., Raff, D., and Temin, P., editors, *Learning by Doing in Firms, Markets, and Countries*, pages 103–138. University of Chicago Press, Chicago.
- Genesove, D. and Mullin, W. P. (2001). Rules, communication, and collusion: Narrative evidence from the sugar institute case. *American Economic Review*, 91(3):379–398.
- George, K. D. and Ward, T. S. (1975). *The Structure of Industry in the EEC: An International Comparison*. Department of Applied Economics, University of Cambridge, Cambridge.
- Gerber, D. J. and Azarnia, R. (1995). Dirigisme and the Challenge of Competition Law in France. *Cardozo J. Int'l & Comp. L.*, 3:9.
- Geroski, P. and Jacquemin, A. (1988). The persistence of profits: a European comparison. *The Economic Journal*, 98(391):375–389.

- Gerschenkron, A. (1974). Soviet Policies versus International Cartels: Four Historical Case Studies. *Slavic Review*, 33(1):69–90.
- Godin, B. (2015). *Innovation contested: The idea of innovation over the centuries*. Routledge.
- Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277.
- Gordon, F. and Squires, D. (2008). The deterrent effect of UK competition enforcement. *De Economist*, 156(4):411–432.
- Green, E. J. and Porter, R. H. (1984). Noncooperative collusion under imperfect price information. *Econometrica: Journal of the Econometric Society*, pages 87–100.
- Griffith, R., Harrison, R., and Simpson, H. (2010). Product market reform and innovation in the EU. *Scandinavian Journal of Economics*, 112(2):389–415.
- Griliches, Z. (1990). Patent statistics as economic indicators: A survey. *Journal of Economic Literature*, 28(4):1661–1707.
- Grossman, G. M. and Helpman, E. (1994). Protection for sale. *The American Economic Review*, 84(4):833–850.
- Guichardaz, R. and Pénin, J. (2019). Why was Schumpeter not more concerned with patents? *Journal of Evolutionary Economics*, 29(4):1361–1369.
- Gupta, B. (1997). Collusion in the Indian tea industry in the great depression: An analysis of panel data. *Explorations in Economic History*, 34(2):155–173.
- Gupta, B. (2001). The international tea cartel during the great depression, 1929–1933. *The Journal of Economic History*, 61(1):144–159.
- Gutmann, J. and Voigt, S. (2014). Lending a hand to the invisible hand? Assessing the effects of newly enacted competition laws. *Assessing the Effects of Newly Enacted Competition Laws (February 8, 2014)*.
- Hague, D. and Wilkinson, G. (2018). *The IRC-An Experiment in Industrial Intervention: A History of the Industrial Reorganisation Corporation*. Routledge.
- Hahn, B. (2007). Making Tobacco Bright: Institutions, Information, and Industrialization in the Creation of an Agricultural Commodity, 1617–1937. *Enterprise & Society*, 8(4):790–798.
- Hahn, B. (2008). Paradox of Precision: Bright Tobacco as Technology Transfer, 1880–1937. *Agricultural History*, 82(2):220–235.
- Hall, B. H., Jaffe, A., and Trajtenberg, M. (2005). Market value and patent citations. *The RAND Journal of Economics*, 36(1):16–38.
- Hall, P. A. and Soskice, D. (2001). *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford University Press.
- Hammoudeh, M. and Nain, A. (2024). Seeking efficiency or price gouging? Evidence from pharmaceutical mergers. *Journal of Corporate Finance*, 87:102623.
- Hannah, L. (1983). *The Rise of the Corporate Economy*. Methuen, London and New York.
- Hannah, L. (2006). The whig fable of american tobacco, 1895–1913. *The Journal of Economic History*, 66(1):42–73.
- Hannah, L. and Kay, J. (1977). *Concentration in modern industry: Theory, measurement and the UK experience*. Springer.
- Harris, N. (2013). *Competition and the Corporate Society: British Conservatives, the State and Industry 1945–1964*. Routledge, London.
- Hart, O., Tirole, J., Carlton, D. W., and Williamson, O. E. (1990). Vertical integration and market foreclosure. *Brookings Papers on Economic Activity: Microeconomics*, 1990:205–286.
- Hart, P. (1962). The size and growth of firms. *Economica*, pages 29–39.

- Hart, P. E. and Clarke, R. (1980). *Concentration in British Industry 1935–75*. Cambridge University Press, Cambridge.
- Hart, P. E. and Prais, S. J. (1956). The analysis of business concentration: a statistical approach. *Journal of the Royal Statistical Society. Series A (General)*, 119(2):150–191.
- Havrileskyo, T. and Barth, R. (1969). Non-price competition in the cigarette industry. *Antitrust Bull.*, 14:607.
- Heald, G. and Wybrow, R. (1986). *The Gallup Survey of Britain*. Croom Helm.
- Heath, J. (1963). *Still Not Enough Competition? Business Restrictive Practices Re-examined*. Institute of Economic Affairs, London, 2nd edition.
- Heath, J. B. (1961). Restrictive practices and after. *Manchester School of Economic and Social Studies*, 29:173–202.
- Hendry, J. (1989). *Innovating for Failure: Government Policy and the Early British Computer Industry*. MIT Press, Cambridge, MA.
- Herbert Smith Freehills (2024). Vodafone/Three JV cleared in UK with behavioural remedies—key takeaways and implications. <https://www.hsfkramer.com/notes/crt/2024-posts/Vodafone-Three-JV-cleared-in-UK-with-behavioural-remedies--key-takeaways-and-implications-for-future>
- Hewitt, L. (2024). Monopoly Menace: The Rise and Fall of Cartel Capitalism in Western Europe, 1918–1957. *Enterprise & Society*, 25(4):992–1014.
- Hibbs Jr, D. A. (1977). Political parties and macroeconomic policy. *American Political Science Review*, 71(4):1467–1487.
- Hicks, J. R. (1935). Annual survey of economic theory: The theory of monopoly. *Econometrica*, 3:1–20.
- Higgins, D. M. (2003). British manufacturing financial performance, 1950–79: Implications for the productivity debate and the post-war consensus. *Business History*, 45(3):52–71.
- Hills, J. (1981). The Industrial Reorganization Corporation: The Case of the AEI/GEC and English Electric/GEC Mergers. *Public Administration*, 59(1).
- Hindley, B. and Richardson, R. (1983). United Kingdom: An Experiment in Picking Winners—the Industrial Reorganisation Corporation. In *State Investment Companies in Western Europe: Picking Winners or Backing Losers?*, pages 125–155. Springer.
- Hollenbeck, B. (2020). Horizontal mergers and innovation in concentrated industries. *Quantitative Marketing and Economics*, 18(1):1–37.
- Hunter, A. (1966). *Competition and the Law*. George Allen & Unwin, London.
- Hüschelrath, K. and Smuda, F. (2013). Do cartel breakdowns induce mergers? Evidence from EC cartel cases. *European Competition Journal*, 9(2):407–429.
- Hytyinen, A., Steen, F., and Toivanen, O. (2018). Cartels uncovered. *American Economic Journal: Microeconomics*, 10(4):190–222.
- Institute of Economic Affairs (1961). Not Enough Competition? Business Restrictive Practices Examined.
- Jarrell, G. A., Brickley, J. A., and Netter, J. M. (1988). The market for corporate control: The empirical evidence since 1980. *Journal of Economic Perspectives*, 2(1):49–68.
- Jaspers, J. D. (2017). Managing cartels: How cartel participants create stability in the absence of law. *European Journal on Criminal Policy and Research*, 23(3):319–335.
- Jeffreys, D. (2008). *Hell's cartel: IG Farben and the making of Hitler's war machine*. Macmillan.
- Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76(2):323–329.
- Jensen, M. C. and Ruback, R. S. (1983). The market for corporate control: The scientific evidence. *Journal of Financial Economics*, 11(1-4):5–50.

- Jha, P. and Chaloupka, F. J. (2000). The economics of global tobacco control. *The BMJ*, 321(7257):358–361.
- Juhász, R., Lane, N., and Rodrik, D. (2024). The new economics of industrial policy. *Annual Review of Economics*, 16(1):213–242.
- Kaldor, N. (1950). The economic aspects of advertising. *The Review of Economic Studies*, 18(1):1–27.
- Kamien, M. and Schwartz, N. (1982). *Market structure and innovation*. Cambridge University Press.
- Karampatos, C. and Alexis, N. (2024). Mechanising the Greek Tobacco Industry: Worker Knowledge, Protest, and Territorial Expansion, 1890–1925. In *Tobacco in Global Perspective, 1780–1960: Trade, Knowledge, and Labour*, pages 231–258. Springer.
- Karelskaia, S. and Zuga, E. (2021). Russian Economic Policy in the Late 17th–Early 18th Centuries: The Case of the Tobacco Monopoly. In *International Conference on Comprehensible Science*, pages 96–107. Springer.
- Karlsson, T. (2008). *Downsizing: personnel reductions at the Swedish Tobacco Monopoly, 1915–1939*. PhD thesis, Lund University.
- Karlsson, T. (2013). The dynamics of downsizing: the Swedish Tobacco Monopoly in the 1920s. *Enterprise & Society*, 14(4):829–853.
- Katz, M. L. and Shelanski, H. A. (2005). “Schumpeterian” Competition and Antitrust Policy in High-Tech Markets. *Competition Journal*, 14:47–60.
- Keeler, T. E., Hu, T.-w., Barnett, P. G., Manning, W. G., and Sung, H.-Y. (1996). Do cigarette producers price-discriminate by state? an empirical analysis of local cigarette pricing and taxation. *Journal of health economics*, 15(4):499–512.
- Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. Macmillan. 14th edition, 1973.
- Kitson, M. and Michie, J. (1996). Britain’s industrial performance since 1960: Underinvestment and relative decline. *The Economic Journal*, 106(434):196–212.
- Krueger, A. (1974). The political economy of the rent-seeking society. *American Economic Review*, 64(3):291–303.
- Kumar, M. (1985). Growth, acquisition activity and firm size: evidence from the United Kingdom. *The Journal of Industrial Economics*, pages 327–338.
- Labour Party (2024). Change: Labour party manifesto 2024. <https://labour.org.uk/wp-content/uploads/2024/06/Labour-Party-manifesto-2024.pdf>. Promoted by David Evans on behalf of the Labour Party, 20 Rushworth Street, London, SE1 0SS.
- Laestadius, S. (2003). *Measuring innovations in the knowledge economy*. Sweden.
- Laffont, J.-J. and Tirole, J. (1991). The politics of government decision-making: A theory of regulatory capture. *The Quarterly Journal of Economics*, 106(4):1089–1127.
- Lafontaine, F. and Slade, M. (2007). Vertical integration and firm boundaries: The evidence. *Journal of Economic literature*, 45(3):629–685.
- Lamoreaux, N. R. (1988). *The great merger movement in American business, 1895–1904*. Cambridge University Press.
- Lanzillotti, R. F. (2005). Schumpeter, product innovation and public policy: the case of cigarettes. In *Entrepreneurships, the New Economy and Public Policy: Schumpeterian Perspectives*, pages 11–32. Springer.
- Lazonick, W. (2002). Innovative enterprise and historical transformation. *Enterprise & Society*, 3(1):3–47.
- Leach, D. (1994). The South African cement cartel: A critique of fourie and smith. *South African Journal of Economics*, 62(3):156–168.
- Leibenstein, H. (1966). Allocative efficiency vs.” x-efficiency”. *The American Economic Review*, 56(3):392–415.

- Levenstein, M. C. and Suslow, V. Y. (2006). What determines cartel success? *Journal of economic literature*, 44(1):43–95.
- Levy, D. T., Thirlway, F., Sweanor, D., Liber, A., Maria Sanchez-Romero, L., Meza, R., Douglas, C. E., and Michael Cummings, K. (2023). Do tobacco companies have an incentive to promote “harm reduction” products?: The role of competition. *Nicotine and Tobacco Research*, 25(12):1810–1821.
- London Business School / Wharton Research Data Services (2025). London share price database (lspd). Database. Accessed via subscription.
- Lougheed, A. (2001). The anatomy of an international cartel: Cyanide, 1897–1927. *Prometheus*, 19(1):1–10.
- Lundqvist, T. (1998). The making of a national cartel in the Swedish brewing industry, 1885–1908. *Scandinavian Economic History Review*, 46(3):42–63.
- Machlup, F. (1958). An economic review of the patent system. *United States Government Printing Office*.
- MacKenzie, N. G. (2018). Creating market failure: Business-government relations in the British paper-pulp industry, 1950–1980. *Business History Review*, 92(4):719–741.
- MacKenzie, N. G., Perchard, A., Miller, C., and Forbes, N. (2021). Business-government relations and national economic models: A review and future research directions in varieties of capitalism and beyond. *Business History*, 63(8):1239–1252.
- MacKinlay, A. C. (1997). Event studies in economics and finance. *Journal of Economic Literature*, 35(1):13–39.
- Maddison, A. (1996). Macroeconomic accounts for European countries. In *Quantitative aspects of post-war European economic growth*. Cambridge University Press.
- Maddison, A. (2010). Historical statistics of the world economy, 1-2008ad. www.ggdc.net/maddison.
- Mansfield, E. (1964). Industrial research and development expenditures: Determinants, prospects, and relation to size of firm and inventive output. *Journal of Political Economy*, 72(4):319–340.
- Marshall, A. (1890). *Principles of Economics*. Macmillan and Co., London.
- Marx, K. (1992). *Capital: Volume III*. Capital. Penguin Books Limited.
- Mayhew, A. (1980). Schumpeterian capitalism versus the “Schumpeterian Thesis”. *Journal of Economic Issues*, 14(2):583–592.
- Mazumdar, A. (2022). Algorithmic collusion. *Columbia Law Review*, 122(2):449–488.
- McCloskey, D. N. (1990). *If you’re so smart: The narrative of economic expertise*. University of Chicago Press.
- McCraw, T. K. (2012). Joseph Schumpeter on competition. *Competition Policy International*, 8:194–221.
- McGahan, A. M. (1995). Cooperation in prices and capacities: Trade associations in brewing after repeal. *The Journal of Law and Economics*, 38(2):521–559.
- McGuckin, R. H. and Nguyen, S. V. (1995). On productivity and plant ownership change: New evidence from the longitudinal research database. *The RAND Journal of Economics*, pages 257–276.
- Meeks, G. (1977). *Disappointing Marriage: A Study of the Gains from Merger*. Cambridge University Press, Cambridge.
- Meeks, G. (2017). Theories Came and Went, Good Data Endured: Accounting at Cambridge. In *The Palgrave Companion to Cambridge Economics*, pages 187–205. Palgrave Macmillan.
- Meeks, G. and Meeks, J. G. (2022). *The Merger Mystery: Why Spend Ever More on Mergers when So Many Fail?* Open Book Publishers.
- Meeks, G., Wheeler, J., and Whittington, G. (1998). The Cambridge/DTI Databank of Company Accounts. Technical report, University of Cambridge, Department of Applied Economics.
- Meier, G. M., editor (1995). *Leading Issues in Economic Development*. Oxford University Press, Oxford, 6 edition.

- Membery, Y. (2010). Who killed the News Chronicle? *British Journalism Review*, 21(1):66–72.
- Mennell, W. (1962). *Takeover: The Growth of Monopoly in Britain, 1951 to 1961*. Lawrence & Wishart, London, first edition edition.
- Mercer, H. (2009). *Constructing a competitive order: the hidden history of British antitrust policies*. Cambridge University Press.
- Michie, R. and Williamson, P. (2004). *The British government and the City of London in the twentieth century*. Cambridge University Press.
- Morelli, C. J., Tomlinson, J., and Wright, V. (2012). The managing of competition: government and industry relationships in the jute industry 1957–63. *Business History*, 54(5):765–782.
- Morris, J. (2007). *The Life and Times of Thomas Balogh: A Macaw Among Mandarins*. Liverpool University Press.
- Morton, F. S. (1997). Entry and predation: British shipping cartels 1879–1929. *Journal of Economics & Management Strategy*, 6(4):679–724.
- Moser, P. (2006). What do inventors patent? mimeo, MIT and NBER, available online at <http://web.mit.edu/moser/www/patrat603.pdf>.
- Nagel, S. (2001). Accounting information free of selection bias: A new UK database 1953–1999. Available at SSRN 286272.
- Nicholas, T. (2003). Why schumpeter was right: innovation, market power, and creative destruction in 1920s america. *The Journal of Economic History*, 63(4):1023–1058.
- Nickell, S. J. (1996). Competition and corporate performance. *Journal of Political Economy*, 104(4):724–746.
- Nordhaus, W. D. (1975). The political business cycle. *The Review of Economic Studies*, 42(2):169–190.
- Nutter, G. (1956). Monopoly, bigness, and progress. *Journal of Political Economy*, 64(6):520–527.
- O'Brien, D. P. (1979). *Competition Policy, Profitability and Growth*. Springer.
- O'Hara, G. (2009). ‘This is What Growth Does’: British Views of the European Economies in the Prosperous ‘Golden Age’of 1951–73. *Journal of Contemporary History*, 44(4):697–718.
- O’Mahony, M., of Economic, N. I., and Research, S. (1999). *Britain’s Productivity Performance 1950–1996: An International Perspective*. National Institute of Economic and Social Research (NIESR), London.
- O’Neill, D. (2015). ‘People Love Players’: Teenagers, Romance and Cigarette Marketing in Post-war Britain. In *Proceedings of the Conference on Historical Analysis and Research in Marketing*, volume 17, pages 214–216.
- Ornaghi, C. (2009). Mergers and innovation in big pharma. *International journal of industrial organization*, 27(1):70–79.
- Orr, D. and MacAvoy, P. W. (1965). Price strategies to promote cartel stability. *Economica*, 32(126):186–197.
- Oulton, N. (2018). GDP and the System of National Accounts: Past, Present and Future. Discussion Papers 1802, Centre for Macroeconomics (CFM).
- Owen, G. (1999). *From Empire to Europe: The Decline and Revival of British Industry since the Second World War*. Harper Collins, London.
- Packard, V. (1960). *The Waste Makers*. David McKay Company, New York.
- Park, G. and Park, Y. (2006). On the measurement of patent stock as knowledge indicators. *Technological Forecasting and Social Change*, 73(7):793–812.
- Parker, W. (1984). *Europe, America, and the Wider World*. Cambridge University Press.
- Pass, C. L. (1967). Coupon Trading—An Aspect Of Non-Price Competition In The UK Cigarette Industry. *Bulletin of Economic Research*, 19(2):125–133.

- Paulu, B. (1961). *British Broadcasting in Transition*. University of Minnesota Press, Minneapolis.
- Pavitt, K. (1984). Sectoral patterns of technical change: towards a taxonomy and a theory. *Research Policy*, 13(6):343–373.
- Pemberton, H. (2004). Relative decline and British economic policy in the 1960s. *The Historical Journal*, 47(4):989–1013.
- Perchard, A. and MacKenzie, N. G. (2021). Aligning to disadvantage: How corporate political activity and strategic homophily create path dependence in the firm. *Human Relations*, 74(7):978–1006.
- Perchard, A. and MacKenzie, N. G. (2022). Behind the ‘tartan curtain’: Cartelisation in the Scotch Whisky Industry, 1830–1960. In *A History of Business Cartels*, pages 228–245. Routledge.
- Perloff, J. M., Karp, L. S., and Golan, A. (2007). *Estimating market power and strategies*. Cambridge University Press.
- Peters, L. L. (1989). Managing competition in German coal, 1893–1913. *The Journal of Economic History*, 49(2):419–433.
- Pham, L., Van Vo, L., Le, H., and Le, D. (2018). Asset liquidity and firm innovation. *International Review of Financial Analysis*, 58:225–234.
- Podolny, J. M. and Scott Morton, F. M. (1999). Social status, entry and predation: The case of British shipping cartels 1879–1929. *The Journal of Industrial Economics*, 47(1):41–67.
- Political and Planning, E. (1957). *Industrial Trade Associations: Activities and Organisation*. Routledge.
- Porter, M. E. (1990). *The Competitive Advantage of Nations*. Free Press, New York.
- Prais, S. (1976). *The evolution of giant firms in Britain: A study of the growth of concentration in manufacturing industry in Britain, 1909–70*. Cambridge University Press.
- Pryor, F. L. (1972). An international comparison of concentration ratios. *The Review of Economics and Statistics*, pages 130–140.
- Reekie, W. D. (1999). South African competition law and the diamond” cartel”. *South African Journal of Economic and Management Sciences*, 2(2):292–307.
- Reindl, J. (1997). Collusion and Competition: The Electrical Engineering Industry in the United Kingdom and West Germany between 1945 and the Late 1960s. *Business and Economic History*, pages 738–750.
- Reuters (2024). Vodafone-Three merger approval marks UK antitrust shift. <https://www.reuters.com/business/media-telecom/vodafone-three-merger-approval-marks-uk-antitrust-shift-2024-12-05/>.
- Reuters (2025). Chair of UK competition regulator steps down. <https://www.reuters.com/world/uk/uk-cma-chair-marcus-bokkerink-steps-down-2025-01-21/>.
- Riley, D. C. (2025). *Consuming Anxieties: Alcohol, Tobacco, and Trade in British Satire, 1660–1751*. Rutgers University Press.
- Riordan, M. H. (1998). Anticompetitive vertical integration by a dominant firm. *The American Economic Review*, 88(5):1232–1248.
- Robinson, W. T., Kalyanaram, G., and Urban, G. L. (1994). First-mover advantages from pioneering new markets: A survey of empirical evidence. *Review of Industrial Organization*, 9(1):1–23.
- Robson, M., Townsend, J., and Pavitt, K. (1988). Sectoral patterns of production and use of innovations in the UK: 1945–1983. *Research Policy*, 17(1):1–14.
- Rodrik, D. (2004). Industrial policy for the twenty-first century. Available at SSRN 666808.
- Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of Business*, pages 197–216.
- Rollings, N. (1998). British industry and european integration 1961–73: From first application to final membership. *Business and economic history*, pages 444–454.

- Ross, T. W. (1992). Cartel stability and product differentiation. *International Journal of Industrial Organization*, 10(1):1–13.
- Rotemberg, J. J. and Saloner, G. (1990). Collusive price leadership. *The Journal of Industrial Economics*, pages 93–111.
- Rowley, C. K. (1973). *The British Monopolies Commission*. George Allen & Unwin, London.
- Royal College of Physicians (1962). *Smoking and Health Report*. Pitman, London.
- Rubinstein, W. (2002). *Capitalism, Culture and Decline in Britain: 1750–1990*. Routledge.
- Salop, S. C. and Scheffman, D. T. (1983). Raising rivals' costs. *The American Economic Review*, 73(2):267–271.
- Sawyer, M. C. (1988). Theories of monopoly capitalism. *Journal of Economic Surveys*, 2(1):47–76.
- Scherer, F. M. (1965). Firm size, market structure, opportunity, and the output of patented inventions. *The American Economic Review*, 55(5):1097–1125.
- Scherer, F. M. (1967). Market structure and the employment of scientists and engineers. *The American Economic Review*, 57(3):524–531.
- Scherer, F. M. (1973). The determinants of industrial plant sizes in six nations. *The Review of Economics and Statistics*, pages 135–145.
- Schoar, A. (2002). Effects of corporate diversification on productivity. *The Journal of Finance*, 57(6):2379–2403.
- Schumpeter, J. (1947). *Capitalism, Socialism and Democracy*. New York, second edition.
- Schumpeter, J. A. (1936). The general theory of employment, interest and money, review article.
- Schumpeter, J. A. (1939). *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*. McGraw-Hill Book Company, Inc., New York and London. Volume I.
- Scotchmer, S. (2004). *Innovation and Incentives*. MIT Press, Boston, MA.
- Scott, A. (2009). The evolution of competition law and policy in the United Kingdom. *LSE Law, Society and Economy Working Papers*.
- Shanahan, M. and Fellman, S. (2022). *A history of business cartels: International politics, national policies and anti-competitive behaviour*. Taylor & Francis.
- Shapiro, C. (2019). Protecting competition in the American economy: Merger control, tech titans, labor markets. *Journal of Economic Perspectives*, 33(3):69–93.
- Shapiro, S. S. and Wilk, M. B. (1965). An analysis of variance test for normality (complete samples). *Biometrika*, 52(3/4):591–611.
- Singleton, J. (2023). Going up in smoke: Tobacco and government policy in the age of austerity, 1945–50. *Twentieth Century British History*, 34(4):681–702.
- Snowdon, B. and Vane, H. R. (2005). *Modern Macroeconomics: Its Origins, Development and Current State*. Edward Elgar Publishing, Cheltenham, UK.
- Sokol, D. D. (2014). Tensions between antitrust and industrial policy. *Geo. Mason L. Rev.*, 22:1247.
- Sørgard, L. (2007). The economics of national champions. *European Competition Journal*, 3(1):49–64.
- Spar, D. L. (1994). *The cooperative edge: The internal politics of international cartels*. Cornell University Press.
- Stevens, R. B. and Yamey, B. S. (1965). *The Restrictive Practices Court: a study of the judicial process and economic policy*. Weidenfeld Nicolson, London.
- Stiebale, J. and Reize, F. (2011). The impact of FDI through mergers and acquisitions on innovation in target firms. *International Journal of Industrial Organization*, 29(2):155–167.
- Stiebale, J. and Szücs, F. (2022). Mergers and market power: evidence from rivals' responses in European markets. *The RAND Journal of Economics*, 53(4):678–702.

- Stillman, R. (1983). Examining antitrust policy towards horizontal mergers. *Journal of Financial Economics*, 11(1-4):225–240.
- Storli, E. (2014). Cartel theory and cartel practice: The case of the international aluminum cartels, 1901–1940. *Business History Review*, 88(3):445–467.
- Stucke, M. E. and Ezrachi, A. (2018). Antitrust, algorithmic pricing and tacit collusion. In *Research Handbook on the Law of Artificial Intelligence*, pages 624–648. Edward Elgar Publishing.
- Sumner, D. A. (1981). Measurement of monopoly behavior: an application to the cigarette industry. *Journal of Political Economy*, 89(5):1010–1019.
- Sun, L. and Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 225(2):175–199.
- Supple, B. (1994). Presidential address: fear of failing: economic history and the decline of Britain. *Economic History Review*, pages 441–458.
- Sutherland, A. (1969). *The Monopolies Commission in Action*. Cambridge University Press, Cambridge.
- Sutton, J. (1991). *Sunk costs and market structure: Price competition, advertising, and the evolution of concentration*. MIT press.
- Sutton, J. (2001). *Technology and market structure: theory and history*. MIT press.
- Swann, D., O'Brien, D. P., Mauder, W. P. J., and Howe, W. S. (1974). *Competition in British Industry: Restrictive Practices Legislation in Theory and Practice*. George Allen & Unwin, London.
- Symeonidis, G. (2000). Price competition and market structure: the impact of cartel policy on concentration in the UK. *The Journal of Industrial Economics*, 48(1):1–26.
- Symeonidis, G. (2002). *The Effects of Competition: Cartel Policy and the Evolution of Strategy and Structure in British Industry*. MIT Press.
- Szücs, F. (2014). M&A and R&D: Asymmetric effects on acquirers and targets? *Research Policy*, 43(7):1264–1273.
- Tanzi, V. (1969). *The individual income tax and economic growth: an international comparison: France, Germany, Italy, Japan, United Kingdom, United States*. Johns Hopkins Press.
- Tarmidi, L. T. (1996). Changing structure and competition in the kretek cigarette industry. *Bulletin of Indonesian Economic Studies*, 32(3):85–107.
- Taylor, J. E. (2002). The output effects of government sponsored cartels during the New Deal. *The Journal of Industrial Economics*, 50(1):1–10.
- Taylor, P. (1984). *The Smoke Ring: Tobacco, Money, and Multinational Politics*. Pantheon Books.
- Tenant, R. B. (1950). *The American Cigarette Industry: A Study in Economic Analysis and Public Policy*. Yale University Press, New Haven.
- Tew, B. and Henderson, R. (1959). *Studies in Company Finance: a Symposium on the Economic Analysis and Interpretation of British Company Accounts*. Cambridge University Press.
- Thanassoulis, J. (2025). Letter: Competition is for consumers, not well-connected businesses. <https://www.ft.com/content/a1b97334-a6d0-4941-964a-ccb03b46d7c0>. Published in Financial Times.
- The Guardian (2025). Chair of competition watchdog steps down after Labour intervention. <https://www.theguardian.com/business/2025/jan/21/chair-of-competition-watchdog-steps-down-after-labour-intervention>.
- The Royal Swedish Academy of Sciences (2025). Scientific Background to the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2025. <https://www.nobelprize.org/uploads/2025/10/advanced-economicsciencesprize2025.pdf>.
- Theil, H. (1956). On the Theory of Economic Policy. *American Economic Review*.
- Thomas, S. M. (1967). *Restrictive Trade Practices*. K.C. Johnson-Davies & R. D. Harrington.

- Thompson, N. (2010). Socialist political economy in an age of affluence: The reception of JK Galbraith by the British social-democratic left in the 1950s and 1960s. *Twentieth Century British History*, 21(1):50–79.
- Tinbergen, J. (1952). *On the Theory of Economic Policy*. North-Holland, Amsterdam.
- Tinkler, P. (2001). ‘red tips for hot lips’: advertising cigarettes for young women in Britain, 1920–70. *Women’s History Review*, 10(2):249–272.
- Tirole, J. (2024). Competition and industrial policy in the 21st century. *Oxford Open Economics*, 3(Supplement_1):i983–i1001.
- Tomlinson, J. (1994). British economic policy since 1945. In Floud, R. and McCloskey, D., editors, *The Economic History of Britain Since 1700. Volume 3: 1939–1992*. Cambridge University Press, Cambridge, 2nd edition.
- Tomlinson, J. (1996). Inventing ‘decline’: the falling behind of the British economy in the postwar years. *Economic History Review*, pages 731–757.
- Tomlinson, J. (2001). *The Politics of Decline: Understanding Postwar Britain*. Routledge, London, 1st edition.
- Tomlinson, J. (2003). The decline of the empire and the economic ‘decline’ of Britain. *Twentieth Century British History*, 14(3):201–221.
- Tomlinson, J. (2009). Thrice denied: ‘Declinism’ as a recurrent theme in British history in the long twentieth century. *Twentieth Century British History*, 20(2):227–251.
- Tomlinson, J. (2023). Imagining economic growth in post-war Britain. *Twentieth Century British History*, 34(4):754–779.
- Tomlinson, J. and Tiratsoo, N. (1998). ‘An Old Story, Freshly Told’? A Comment on Broadberry and Crafts’ Approach to Britain’s Early Post-War Economic Performance. *Business History*, 40(2):62–72.
- Trajtenberg, M. (1990). A penny for your quotes: patent citations and the value of innovations. *The RAND Journal of Economics*, pages 172–187.
- Utton, M. (2000). Fifty years of UK competition policy. *Review of Industrial Organization*, 16(3):267–285.
- Van Cayseele, P. (1998). Market structure and innovation: a survey of the last twenty years. *De Economist*, 146(3):391–417.
- Verspagen, B. (2005). Innovation and economic growth. In *The Oxford Handbook of Innovation*. Oxford University Press.
- Vonyó, T. (2008). Post-war reconstruction and the Golden Age of economic growth. *European Review of Economic History*, 12(2):221–241.
- Ward, S., editor (2001). *British culture and the end of empire*, volume 42. Manchester University Press.
- Warlouzet, L. (2019). The EEC/EU as an evolving compromise between French Dirigism and German Ordoliberalism (1957–1995). *JCMS: Journal of Common Market Studies*, 57(1):77–93.
- Warner, K. E. (2000). The economics of tobacco: myths and realities. *Tobacco control*, 9(1):78–89.
- Warren Buffett (1982). Berkshire Hathaway Inc. Chairman’s Letter.
- Warren Buffett (2007). Berkshire Hathaway Inc. Chairman’s Letter.
- Weche, J. and Wambach, A. (2021). The fall and rise of market power in Europe. *Jahrbücher für Nationalökonomie und Statistik*, 241(5–6):555–575.
- Wilks, S. (1999). *In the public interest: Competition policy and the Monopolies and Mergers Commission*. Manchester University Press.
- Williamson, A. (2023). ‘Thirteen Wasted Years’: A Strategy for Starmer? *The Political Quarterly*, 94(4):642–652.

- Williamson, O. E. (1968). Economies as an antitrust defense: The welfare tradeoffs. *The American Economic Review*, 58(1):18–36.
- Williamson, O. E. (1975). Markets and hierarchies: analysis and antitrust implications: a study in the economics of internal organization. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.
- Wilson, H. (1963). Speech to the Labour Party conference. In *Labour Party Annual Conference Report, Scarborough*, volume 1, pages 139–140.
- Wu, T. (2020). *The curse of bigness: how corporate giants came to rule the world*. Atlantic Books.
- Yoon, J.-h. (2025). Nobel Laureate Stresses Antitrust Policies for South Korea's Innovation. *Chosun Ilbo – English*.
- Zingales, L. (2017). Towards a Political Theory of the Firm. *Journal of Economic Perspectives*, 31(3):113–130.
- Zitzewitz, E. W. (2003). Competition and long-run productivity growth in the UK and US tobacco industries, 1879–1939. *The Journal of Industrial Economics*, 51(1):1–33.