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Oxford's Contributions to Industrial Economics from the 1920s to the 1980s

Lise Arena

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Oxford's Contributions to Industrial Economics from the 1920s to the 1980s

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1 Introduction

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Industrial economics is usually defined as the study of the structure of markets, the economic performance of industries, the behaviour of both and the manner in which they interact. The discipline did not emerge as a separate subject area until the inter-war period in the United States and in England.¹ Embryonic forms of industrial economics can be found in earlier economic theories, with the earliest example in the United Kingdom probably being *The Economics of Industry* by Alfred and Mary Paley Marshall (1879). Four decades later, a number of US economists, including Frank Knight (1921) and John Maurice Clark (1922), had succeeded in introducing some central concepts, such as specific forms of imperfect competition and the role of uncertainty and risk in the context of innovation.

While industrial economics focuses on the aggregate analysis of sectors and industries, the theory of the firm is primarily concerned with the internal organisation of firms and firm behaviour. Until the end of the nineteenth century, questions relating to firm organisation were subsumed within the

¹ As Hay and Morris remarked in their internationally known textbook on the subject, 'people have been interested in the economic behaviour and performance of industries since the beginning of the industrial revolution, but the delineation of a specific area of economics under the title of industrial economics is a phenomenon of the last forty years' (Hay and Morris 1979: 3).

L. Arena (✉)

CNRS-Université Côte d'Azur Research Institute GREDEG, Nice, France

e-mail: lise.arena@univ-cotedazur.fr

21 theory of prices and value and were, at best, concerned with sector- or
 22 industry-level analysis (see Marshall and Marshall 1879): firms were “empty
 23 boxes” governed by cost curves (Clapham 1922). The concept of the internal
 24 organisation of a firm remained neglected, especially after Pigou and
 25 Robertson’s highly abstract neoclassical analysis effectively eliminated the
 26 Marshallian concern with the actual workings of the firm (Pigou and
 27 Robertson 1924). In a well-known survey of the theory of the firm, Kenneth
 28 Boulding (1942: 791) attributed early developments in the field to ‘extensive
 29 transformations’ in the basic theory of value in the 1930s.² At the same time,
 30 empirical studies, which were increasingly concerned with the separation of
 31 ownership from management (see Berle and Means 1932), highlighted the
 32 separate existence of firms from markets, and the importance of their internal
 33 forms of organisation for overall economic performance.

34 Since the inter-war period, industrial economics and the theory of the firm
 35 have constituted a significant part of applied microeconomics. This chapter
 36 seeks to provide a better understanding of Oxford’s contributions to the emer-
 37 gence and the institutionalisation of industrial economics as an academic dis-
 38 cipline. It falls into four main parts: “Premises”, triggered by David Macgregor’s
 39 contribution and the Oxford Economists’ Research Group (OERG)
 40 (1921–1965); “Roots”, illustrated by the research on the Courtauld Inquiry
 41 and Philip Andrews’ contribution (1943–1947); “Institutionalisation”, evi-
 42 denced by the creation of the *Journal of Industrial Economics* (1952–1968);
 43 and “Transformation”, exemplified by the shift of the discipline towards
 44 industrial organisation (1979–1991). Despite the prominent position of its
 45 researchers in their respective fields, Oxford’s leading role in the emergence of
 46 industrial economics is not attributable to any specific school of thought it
 47 produced, as could be argued was the case at Cambridge. Rather, the Oxford
 48 case stands out because of its contribution to the emergence and development
 49 of institutions that are still internationally central to the discipline.

50 **2 Premises: From Macgregor’s (Isolated)** 51 **Contribution to the OERG in the Analysis** 52 **of Industrial Firms (1921–1965)**

53 Until the post-war period, there was no established form of industrial eco-
 54 nomics at Oxford, despite a significant number of scholars interested in the
 55 study of industrial structures and firms. The premises of the academic

² Boulding was specifically referring to Chamberlin (1933) and Robinson (1933), noting that ‘these volumes mark the explicit recognition of the theory of the firm as an integral division of economic analysis upon which rests the whole fabric of equilibrium theory’ (Boulding 1942: 791).

discipline were fostered by a relatively obscure economist, David Hutchison Macgregor, who was involved in the creation of an informal group of Oxford economists known as the Oxford Economists' Research Group (OERG).

2.1 Macgregor and Embryonic Industrial Economics

This section considers the life and work of Macgregor who published a substantial amount on the theory of the firm and contributed to the development of Oxford industrial economics. Macgregor studied economics at Cambridge where he obtained a BA in 1901. There, he became 'one of Marshall's favourite students and became quite attached to his method, i.e. to the use of theory tempered by empirical investigation' (Lee 1989: 23). In particular, it was argued that if Macgregor 'used Marshallian methods that was because, testing them as far as he could against the facts of ordinary life they seemed to him the best available' (Andrews 1953: 348). During his stay at Cambridge, Macgregor prepared his *Industrial Combination*, which was published in 1906 and resulted in him being elected a Fellow of Trinity College, Cambridge, in 1904. According to Lee's biography of Macgregor, at this time he was 'employed as a university lecturer in general economics and was paid, unofficially, by Marshall for the work' (Lee 2008: 3). In 1908, Macgregor left Cambridge to become Professor of Political Economy at the University of Leeds.

Macgregor's *Report of Travels* (1913) expressed his interest in studying forms of industrial organisation in different countries, such as China, Japan, India, Russia and the United States. In particular, Macgregor 'had in view specially the relation of foreign nations to the great industrial changes which occurred in England nearly a century and a half ago—changes to which we owe the nature and the problems of our present industrial life' (ibid.: 8). In 1919, Macgregor moved to Manchester where he became Stanley Professor of Political Economy. He stayed there for only two years, as in 1921, Edgeworth vacated the Chair at Oxford, and according to Young and Lee (1993: 12), although Macgregor 'did not formally apply for the Drummond', the 'electors offered it to him'. Immediately after his appointment, Macgregor engaged in extensive research concerned with a wide range of economics topics, such as: unemployment (Macgregor 1923); consumption (Macgregor 1924); agriculture (Macgregor 1925); and family allowances (Macgregor 1926). He also pursued his research interests in industrial economics and prepared the final revision of his 1906 book. In addition, towards the end of the 1920s, Macgregor published his research on cartels and other industrial combinations (Macgregor 1927a, 1929, 1930) and became interested in proposals for

94 the rationalisation of industry (Macgregor 1927b). From 1925 until 1937, he
 95 was joint editor of the *Economic Journal*, with John Maynard Keynes.³

96 Macgregor's concern with an empirical approach to economics was reflected
 97 by the statistical investigations conducted in his various articles. Although his
 98 intellectual orientation and personality made him, to some extent, an isolated
 99 figure, he still contributed to the development of the theory of the firm and
 100 industrial economics at Oxford, both at the teaching and research level.
 101 Macgregor's analysis did not follow the usual methods of pure maximisation
 102 and equilibrium concepts. Rather, he was more interested in the growth of firms
 103 and the way that they were able to reproduce themselves. His main idea was that
 104 new competition came about from skilled businessmen who had learnt the
 105 trade, who promoted existing relations with customers and suppliers and who
 106 used their savings (and personal connections) to start their own businesses.

107 By the mid-1930s, Macgregor had published *Enterprise Purpose & Profit*
 108 (1934)—concerned with the behaviour of firms over the trade cycle under
 109 risk and uncertainty—where he 'used the formations of new joint stock com-
 110 panies to represent the course of enterprise' to discover that 'variations of this
 111 index precede variations of both prices and employment' (Todd 1935: 544).
 112 To him, variations in financial and stock market conditions reflected varia-
 113 tions in company formations. Hence, the concept of strategic behaviour is
 114 implicitly used at the heart of Macgregor's contribution: once a firm has
 115 entered into competition and is established in the market, it then follows
 116 long-term policies, such as stable prices, balanced with more short-term ones,
 117 such as decisions to expand.

118 Despite his research, Macgregor's message did not take hold at Oxford at
 119 the time, his contribution eclipsed by the then evolving mainstream of micro-
 120 economics. This situation made him, as recently argued by Warren Samuels,
 121 'an "applied" economist in a new world dominated by "pure" economics'
 122 (Samuels 2008: 150).⁴ Yet, he could not be completely ignored by mainstream
 123 economists due to his steady flow of books and journal articles principally
 124 published in the *Economic Journal* and more occasionally in *Economica* until

³ Further information about this can be found in Macgregor's correspondence with Roy Harrod. See in particular Letter 119R, Macgregor to Harrod, 18 September 1926 (Besomi 2003: 74); Letter 150, Harrod to Macgregor, 7 July 1928 (ibid.: 95); Letter 337, Keynes to Harrod, 30 December 1933 (ibid.: 259); Letter 456R, Macgregor to Harrod, 12 July 1935 (ibid.: 397).

⁴ This view is also reinforced by Maurice Allen who argued that '[Macgregor] was in the old-fashioned Marshall tradition and had ... little interest in rigorous analysis that came into vogue in the later years of his life. In my view, he was none the worse for that. I should say that in his books ... and in his teaching he gave students a sounder understanding of the problems of the economy of his time than contemporary dons give them at present ... It seems to me that ... the value of his contribution was underestimated because the newer trends (fashions?) in economics passed him by' (Allen in Lee 2008: 1).

the mid-1930s. Furthermore, *Industrial Combination* still constituted an early significant account of industrial economics, which was reprinted on several occasions and was used as an economics textbook by subsequent generations of students inside and outside Oxford.⁵

2.2 The Role of the OERG in the Analysis of Industrial Firms

Despite his isolated position, Macgregor became an 'active and enthusiastic member' of the OERG shortly after its creation (Andrews 1953: 346). The Group was created in 1936 and was initially led by Sir Hubert Henderson who was the sole Professor of Economics at Oxford. The earliest members were all economists and teaching fellows at Oxford at the time. They are listed in Appendix 1 at the end of this chapter. Andrews, who came to Oxford in 1937 as a member of the research staff, became Secretary of the OERG.

A couple of years after the establishment of the first Sub-Faculty in Economics at Oxford in 1932, All Souls College offered a Readership in Economic Statistics to promote systematic empirical work in social studies. Oxford economists—who were already developing the work of the Oxford Institute of Statistics (OIS)—took the opportunity to approach the Rockefeller Foundation. In 1937, the financial assistance given by the Foundation to Roy Harrod enabled the Group to grow, in two years, from a relatively small number of participants to more than nineteen members.

The meetings of the OERG were quite informal and their studies basically consisted of sets of inquiries or research projects which usually took about eighteen months and which were based upon questionnaires. These questionnaires were sent in advance and then formed the basis for after-dinner interviews with businessmen who were invited to come to Oxford to dine and spend an evening answering members' questions. Intensive questioning and discussions often took place until the small hours of the morning. A record was kept of what was said at each meeting and sent back to the guest, allowing him to alter his comments. This procedure was considered to be a completely new methodology at the time and broke with traditional deductive methods.

⁵ For example, in 1937, the "Current Notes" section in the *Journal of the Royal Statistical Society* states that 'Middle-aged students of industrial combinations will remember the publication in 1906 of an important work on that subject by D.H. Macgregor ... It has been for some time out of print, and we are indebted to the London School of Economics and Political Science for securing its re-issue as the first of a series of reprints of scarce works on political economy ... Even after thirty years it will repay perusal, for it differs from the usual books confined to description or denunciation and is a dispassionate study of the economic aspects of the movement' (Current Notes 1937: 144–145).

156 While the topics studied within the Group were diverse and not only
 157 focused on firms and industries, its most notable research concerned the influ-
 158 ence of interest rates on investment, and the pricing policies of firms. It was
 159 found that investment decisions taken by businessmen were influenced very
 160 little by changes in the rates of interest. Regarding pricing policies, many of
 161 the businessmen participants claimed to set prices according to the “full-cost”
 162 principle, that is, calculating the average cost of production and then adding
 163 a margin. In October 1938, the Group published its results in the first issue
 164 of *Oxford Economic Papers*. Indeed, a key purpose of the journal was to make
 165 public the empirical research being carried out by the OERG and the OIS.

166 In 1939, the OERG published papers on pricing, in particular the famous
 167 Hall-Hitch exposition of the full-cost principle. It was the first time that theo-
 168 rists had examined actual business practice. They used questionnaires for a
 169 sample of thirty-eight firms, with the results showing that a significant pro-
 170 portion of these companies did indeed set their prices according to full-cost.
 171 Typically, a company would make an ex-ante estimate of its output for the
 172 coming year, then determine average cost (direct costs, e.g. labour, materials,
 173 energy, per unit of product) and then add to it percentage margins for profit—
 174 the “mark-up”. The firms in question insisted that this pricing mechanism was
 175 a “rule of thumb” and could result in maximum profits by accident only.
 176 Hence, the results of the survey appeared to conflict with the received doc-
 177 trine of the time. In other words, this exercise tested the conventional assump-
 178 tion of maximisation in terms of equalisation of marginal cost and marginal
 179 revenue. In fact, Hall and Hitch justified the full-cost principle by arguing
 180 that ‘producers cannot know their demand or marginal revenue curves’ (Hall
 181 and Hitch 1939: 22). Thus, the evidence obtained from the businessmen
 182 showed that they did not and could not use marginal revenue and cost (i.e.
 183 any forms of marginalism) to set prices. Rather, it indicated ‘that they [were]
 184 thinking in altogether different terms’ (ibid.: 18).

185 After the publication of the articles in *Oxford Economic Papers*,⁶ the Group
 186 was full of intellectual vitality and raring to take their research forward, but
 187 when the War started in September 1939, members were dispersed, disrupt-
 188 ing the OERG, which became inactive for the duration of hostilities.⁷

189 The conventional wisdom on the post-war OERG is that it had a limited
 190 effect on Oxford economics in terms of influence and direction of research.

⁶These publications were reprinted in *Oxford Studies in the Price Mechanism* in 1951 edited by Wilson and Andrews.

⁷One of the difficulties for scholars in collecting archival evidence from this period is the lack of documentation. The rumour, which was still circulating many decades later, was that concerns about a Nazi invasion and confidentiality issues led Harrod and Andrews to burn the files which contained the entire proceedings of the Group in the boilers of Christ Church College, Oxford.

According to some of its former members, the OERG tried to resurrect itself after the War, but the drive and interest that existed before 1939 had gone. Nevertheless, the Group did reform, and some new members played an active part in its reconstruction. Roy Harrod took the chair and was accompanied by some new and some old members, listed in Appendix 2. As can be seen in this Appendix, Frank Burchardt, Hubert Henderson and Edward Hugh-Jones still attended meetings, along with Philip Andrews, who became the new Secretary of the Group and was assisted by Elizabeth Brunner, one of the very few female members.

During the post-war period, the members of the OERG were more concerned with researching the internal organisation of the firm. Work on pricing had been completed before the War and the post-war Group began to look at issues such as productivity and factors affecting capital expenditure (Andrews and Brunner 1950: 197). Between 1950 and the end of the OERG, four main themes were studied: pricing policy of exporters when the exchange rate altered; relationships between firms; business investment; and the sources of growth. Papers looking at the last of these were published in the March 1964 number of *Oxford Economic Papers* (Leyland 1964; Richardson 1964; Richardson and Leyland 1964).

At the beginning of the 1960s, the links that had been developed with businessmen were still growing, especially with the help of Harrod, Richardson, Leyland and Andrews, and the reputation of Oxford itself. Meanwhile, in November 1962, Roger Opie became Secretary of the Group in place of Norman Leyland. At the same time, however, the Group's members started showing some loss of interest in its work and the decision to try to increase membership and invite new economists was taken. This did not work, however, and by the summer of 1964 the Group started to seriously question its relevance. A meeting in 1965 examined forecasts and business decisions, this turning out to be the last gathering of the OERG.

3 Roots: From the Courtauld Inquiry to the Publication of *Manufacturing Business* (1943–1949)

The outbreak of War transformed economics research at Oxford and provided some new war-related research topics for the OERG and the OIS. This new range of issues soon became institutionally based and gave rise to new developments within the University, such as the Nuffield College Post-War

227 Reconstruction Survey (1941–1944) which led to the Courtauld Inquiry
 228 (1943–1947). Later on, the publication of *Manufacturing Business* by Philip
 229 Andrews in 1949 ushered in a new period of institutionalisation.

230 3.1 Courtauld Inquiry (1943–1947)

231 In 1937, the philanthropist, Lord Nuffield, expressed his desire to fund the
 232 creation of a new postgraduate residential college at Oxford which would be
 233 devoted to the study of both engineering and accountancy. While the form of
 234 the offer proposed by Nuffield did not match the University's desire, it was
 235 still seen as a major opportunity to provide some coherence within social
 236 studies at Oxford. Nuffield's offer was discussed between Alexander Dunlop
 237 Lindsay (Vice-Chancellor of Oxford) and the economist William Beveridge
 238 (then Master of University College), the latter clearly disapproving the idea of
 239 Nuffield's project on the grounds that it was not sensible to focus exclusively
 240 on the type of research being suggested (Taylor 2008). Eventually, Lindsay
 241 convinced Nuffield to fund a college just concerned with social studies, to the
 242 exclusion of engineering.

243 In May 1940, the Warden of Nuffield, Harold Butler, proposed to the
 244 College Committee a project which would look at the problems of post-war
 245 economic and social reconstruction. At this stage, G.D.H. Cole and Lindsay
 246 (also members of the Committee) suggested that Butler's proposal was too
 247 focused on a post-war context, and should rather deal with the changes then
 248 taking place in the economy, such as the effects of the redistribution of popu-
 249 lation. During the following months, Cole and Lindsay went in search for
 250 financial support for their project from the government. By April 1941, fund-
 251 ing had been secured, and under Cole's enthusiastic direction, work began on
 252 examining the economic and social prospects of Britain's main industrial
 253 regions (Young and Lee 1993: 142). Over the next two years, Cole invested
 254 the majority of his time and energy in this effort. However, the purpose of this
 255 Social Reconstruction Survey was soon being criticised by senior members of
 256 the University and by some of Cole's colleagues at Nuffield who questioned its
 257 practicality.

258 The "failure" of the Survey did not help with the promotion of social stud-
 259 ies at Oxford. Shortly before Cole's resignation in 1944, he received a letter in
 260 March 1943 from Samuel Courtauld, Visiting Fellow at Nuffield and wealthy
 261 textile industrialist, expressing his doubts about the dictum "bigger is better".
 262 Courtauld offered to partially finance an investigation which would aim to
 263 collect evidence among firms and their accountants on the issue of the growth

of firms. In 1943, it was decided that a six-month pilot investigation should be undertaken. This became known as the “Courtauld Inquiry” and was placed under a special committee called the “Courtauld Committee” within the College Committee at Nuffield.⁸ The theoretical investigation—concerned with the optimum size of a firm—was conducted by Josef Steindl, J.R.L. Schneider and Arthur Bowley and worked out of the OIS.

In May 1944, the first report of the Courtauld Committee was sent to Courtauld who particularly liked the statistical investigation conducted by Andrews, ‘because it dealt with Courtauld’s data obtained from the [Courtauld] accountants’ (ibid.: 149). As a result, Henry Clay, who had taken over from Butler as Warden of Nuffield in 1945, agreed with Courtauld that Andrews should continue his statistical investigation. The latter went one step further, proposing to Clay and Courtauld that he expand his study to the clothing and shoe industries. Over the next two years, Andrews, along with the help of the OIS, carried out this additional investigation with the assistance of his collaborator, Elizabeth Brunner. Although Courtauld died in 1947, funding for the project went on until 1949 and led Andrews to publish his results in *Manufacturing Business*.

3.2 Phillips Andrews’ Contribution and the Publication of *Manufacturing Business*

Manufacturing Business was published in 1949 in a very specific context. It constituted, on the one hand, a reaction to the well-known Cambridge Cost Controversies of the 1920s and 1930s and was, on the other hand, to a large extent a continuation of the famous Hall and Hitch empirical investigation which appeared in 1939. The Cost Controversies questioned the theoretical meaning of Marshall’s work and especially Pigou’s specific interpretation of it. Hall and Hitch, however, as shown earlier, followed a more empirical critique and sought to demonstrate that the assumption of short-run profit maximisation which formed the basis of Pigou’s interpretation clearly contradicted the pricing practices of businessmen.

In addition to this theoretical background, it is relevant to recall that *Manufacturing Business* emerged from the initial Courtauld Inquiry and was

⁸ Archival documents about the Courtauld Inquiry can be found in the Andrews and Brunner Archive held at the London School of Economics (LSE). See, in particular, Box 56, which contains an interesting note on the relative efficiency of small and big businesses; Box 58, which contains some documents about big and small business; Box 60, which contains a report to the Courtauld Committee written by Andrews in 1945; and Box 63.

296 also an attempt to provide some “practical” tools and empirical evidence for
 297 the few existing theories on the internal organisation of the firm. Andrews
 298 made clear his theoretical inspiration:

299 This mention of a wider experience gives me an opportunity to pay a tribute to
 300 a major element in my education as an industrial economist—my association
 301 with the pre-war Oxford Economists’ Research Group ... It was the work of this
 302 Research Group that developed so strongly the conviction that the behaviour of
 303 business men was consistent, and that, accordingly, even though, on many
 304 points, it might not seem directly explicable by generally accepted economic
 305 theory, there was hope that one would arrive at a consistent theory by studying
 306 individual businesses. (Andrews 1949: xv)

307 In the volume, Andrews used an approach based on observed industrial
 308 realities at the expense of elementary mathematical formalism. Andrews’ first
 309 objective was to illustrate the combination of both deductive and inductive
 310 approaches, and to emphasise their complementarities. Thus, accordingly,
 311 *Manufacturing Business* was largely concerned with the complex facts of busi-
 312 ness life, expressed by a detailed investigation of specific firms and industries.

313 At the same time, however, Andrews tried to develop analytical founda-
 314 tions to go with Hall and Hitch’s empirical results. In fact, he was strongly in
 315 favour of an integrative approach, combining the full-cost principle (reshaped
 316 as “normal cost”) with a revival of the Marshallian framework. Andrews’ main
 317 idea was that in his analysis of the short run, Marshall could clearly be inter-
 318 preted with the help of marginal tools. His analysis of the long period was,
 319 however, considered to be incompatible with these tools and their individual-
 320 istic foundations.⁹ Andrews’ interpretation of Marshall’s theory in particular
 321 stressed the existence of long-run supply curves, including economies of scale.
 322 The expansion of a firm’s operations over the long run could not be supported
 323 by a marginal approach, which only admitted increasing average costs across
 324 such a time period.

325 Andrews’ expression of normal costs in the long run was, to a large extent,
 326 influenced by Marshall’s long-period theoretical framework, and especially by
 327 his concept of the representative firm. By contrast with the marginal

⁹To a large extent, therefore, Andrews’ innovations were analytically rooted. In this context, some years after the publication of *Manufacturing Business*, he wrote: ‘As I interpret Marshall, the root cause of his treatment of long run supply at the level of the individual firm is that he thinks of falling, rising or constant cost as being equally conceivable conditions in what he wishes to analyse as competitive industries and—as so many passages show—he thinks of manufacturing industry as typically showing falling average costs as expanded outputs are maintained in the long run’ (Andrews’ Lecture Notes IV, 2 December 1968, Andrews and Brunner Archive, LSE: 2).

interpretation of the representative firm, which considered this concept as an equilibrium firm, Andrews considered it as a firm which represented the reality of industry. He made it clear in the following note:

This [concept of the representative firm] was his [Marshall's] new semi-historical concept which he brought into his analysis. In Book IV, Ch. XIII, p. 317 when he refers to the long period, he talks about normal expenses of production and says that for these we must refer to the representative firm, not to any particular competitive firm. (Andrews' Lecture Notes IV, 2 December 1968, Andrews and Brunner Archive, LSE: 3; underlining in original)

Hence, Andrews refused to see Marshall's contribution to economics as a 'static marginalist equilibrium theory'¹⁰ extended to the long run. Marshall's representative firm was rather an industrial concept and 'in effect he [Marshall] is saying that we must refer the industrial supply curve to industrial conditions and not disaggregate it to purport to get long run marginal cost curves for individual businesses'. Thus, the content and methodology of *Manufacturing Business* was a direct attack on the marginalist theory of the firm.

From *Manufacturing Business* emerged a series of further work on industries which led, in turn, to the establishment of industrial economics as an academic discipline at Oxford.

4 Institutionalisation: From the Creation of the *Journal of Industrial Economics* to Further Developments Towards Information- and Knowledge-Based Approaches to the Firm (1952–1968)

Philip Andrews' contribution to the development of industrial economics at Oxford went one step further after the publication of *Manufacturing Business* with his creation of the *Journal of Industrial Economics* in 1952. In parallel, further developments in the discipline in terms of information- and knowledge-based approaches to the analysis of the behaviour of industrial firms helped to propel Oxford's importance in the field.

¹⁰ Or 'SMET', as Andrews referred to the marginalist approach in his Lecture Notes.

359 4.1 Creation of the *Journal of Industrial Economics*

360 As a response to the wave of interest in empirical studies of industries
 361 described earlier, the first issue of the *Journal of Industrial Economics* in 1952
 362 represented the confirmation of industrial economics as a stand-alone disci-
 363 pline. The aim of the *Journal* was to drive the new discipline forward, not only
 364 based upon industrial facts, but also supported by general theoretical
 365 assertions:

366 Then in 1952 he [Andrews] founded the *Journal of Industrial Economics*. Did
 367 not mean just the old economics of industries. The new term for a new subject
 368 was not established then as it is now ... searching about whether we could use
 369 the term and not be misunderstood. It is very definitely not just an “applied”
 370 subject. The heart of it is the study of the individual business unit and the
 371 decision-making process—investment, pricing, etc.—and also of course the
 372 relationships between businesses, which brings in the study of industrial struc-
 373 ture, restrictive practices and environment generally. (Talk given by E. Brunner
 374 to Frank Friday Group (c.1961), Andrews and Brunner Archive, LSE,
 375 Box 529: 1–2)

376 The first issues of the *Journal* were largely concerned with industrial mat-
 377 ters, often supported by case studies. For instance, the first article of the first
 378 issue, which was written by Edward Mason, mainly focused on the specific
 379 case of the raw products industry in the United States (Mason 1952). In the
 380 same issue, Fred Stones wrote about ‘Price Policy in a Nationally Administered
 381 Industry’ (Stones 1952) while Robert Shone considered ‘Steel Price Policy’
 382 (Shone 1952). The making of business decisions—particularly those studied
 383 by Frank Friday in the first issue with his paper on ‘The Problem of Business
 384 Forecasting’ (Friday 1952)—was also a central issue for the *Journal*.

385 4.2 The Information- and Knowledge-Based 386 Approaches to the Firm: Contributions by 387 Richardson and Malmgren

388 Less than a decade after the emergence of the *Journal of Industrial Economics*,
 389 a new trend in the economics of industry and competition emerged with the
 390 contributions made by two Oxford economists: George Richardson and
 391 Harald Malmgren, both students of John Hicks. The development of the
 392 Richardson-Malmgren view of the behaviour of industrial firms was not a
 393 coincidence or an unintended consequence of their respective work, but on

the contrary was largely influenced by the intellectual context of Oxford in the late 1950s and early 1960s. Indeed, Richardson and Malmgren were not aware of each other's work until quite late on.

The Richardson-Malmgren approach stressed the role of information and knowledge in explaining industrial behaviours. Several remarks can be made about the similarities between both authors.

George Richardson contributed to a new strand of thinking in the field of industrial economics, stressing the role of information in the evolution of firms. Richardson opened *Information and Investment* (1960) with a critique of the concept of perfect competition and of the Walrasian general economic equilibrium (GEE) theory. This stressed the fundamental importance of information and knowledge and led to Richardson's more general critique of the suppression of the co-ordination problem in neoclassical microeconomics. In fact, according to Richardson, informational factors within the firm are essential, mainly because 'no direct connection can exist between objective conditions and purposive activity; the immediate relationship is between *beliefs* about relevant conditions and *planned* activities which it may or may not prove impossible to implement' (Richardson 1959: 224; italics in original). Thus, Richardson's critique of GEE theory was made on the basis of the existence of informational factors. Company performance largely depends on what Richardson called the "market conditions" in the GEE. This includes both "primary" conditions (concerned with technical production possibilities and the current state of consumer preferences) and "secondary conditions" meaning the 'relevant projected activities' of other economic agents (ibid.: 229). As Richardson puts it, '[firms'] mutual interdependence clearly presents, for entrepreneurs, a barrier to obtaining the necessary secondary information, and, if we are to hope to show how a system can work, we cannot escape the obligation to explain how the barrier is overcome' (ibid.: 230). This concept of mutual interdependence providing more information to the firm represents the rationale behind the emergence of co-ordination.

Harald Malmgren worked on very similar issues but seems not to have been aware of Richardson's work until he was very far advanced in writing his thesis.¹¹ He spent much time discussing period analysis with his supervisor, John Hicks, after the publication of *Value and Capital* (1939). In line with Richardson's argument, Malmgren's work on the concept of time periods led to insights regarding the importance of new flows of information in the process of decision-making and located informational factors at the heart of his theory of industries. In fact, Malmgren argued that firms entered into

¹¹ Malmgren (private correspondence, 2008).

432 co-operation to stabilise the expectations of managers and could therefore
433 reduce transaction costs (as also argued by Richardson). Malmgren's contribu-
434 tion was original and constituted a first attempt in paving the way to a new
435 kind of industrial organisation, mainly based on organisational and firm the-
436 ory. His contributions favoured a multi-disciplinary approach, incorporating
437 ideas not only from economics, but also from organisational theory, game
438 theory and information theory.

439 The desire for realism expressed by the co-ordination approach to industrial
440 economics does not, however, imply that Richardson's and Malmgren's con-
441 tributions were purely empirical. On the contrary, their publications remain
442 theoretically grounded, especially regarding their insights on the importance
443 of co-ordination and individual interactions in a decision-making process. A
444 modern theorist of the firm, reading their texts for the first time, may be
445 tempted to link their examination of decision-making to early game theory in
446 that they consider the importance of strategic interactions. However, this
447 interpretation would be misleading as Richardson and Malmgren made it
448 clear that, even though they were aware of game theory, they did not explicitly
449 employ it in their research.

450 Richardson's work could not be framed in terms of game theory mainly
451 because, in his framework of investment co-ordination, before "placing their
452 bets", entrepreneurs are first trying to improve the information they have
453 about other agents, since the actions of others necessarily influence the out-
454 comes of their own choices (Earl 1998: 18). In other words, Richardson was
455 much more interested in the way that agents search for and collect informa-
456 tion than by their strategic choices per se. Similarly, in his DPhil thesis,
457 Malmgren made clear his rejection of game theory. Indeed, he argued that the
458 solution to strategic interactions could only depend on the initial nature of
459 the information available to each competitor and, therefore, on the degree of
460 communication between these competitors. In this respect, Malmgren
461 rejected the "theory of games" approach, 'which ordinarily requires perfect
462 information', and which realistically 'turns out to be a non-zero-sum game'
463 with an indeterminate solution (Malmgren 1961: 253).

464 The novelty of Richardson's and Malmgren's approaches to Oxford indus-
465 trial economics was mainly due to their success in providing an alternative
466 framework to GEE theory, which remained predominant at Oxford after hav-
467 ing been revived by the publication of Hicks' *Value and Capital*, twenty years
468 before. The Richardson-Malmgren co-ordination view of the firm, as it stood,
469 also offered an alternative to contemporary developments in game theory,
470 which were mainly concerned with strategic choices and much less with the
471 nature of information and knowledge at an individual level.

5 Transformation: From Industrial Economics to Industrial Organisation (1979–1991) 472 473

Two Oxford economists influenced the general orientation of the subject of industrial economics at Oxford during the last part of the twentieth century. Donald Hay's and Derek Morris' roles in Oxford economics are often associated with their landmark textbook, *Industrial Economics: Theory and Evidence*, which is considered as important historical evidence regarding the evolution of industrial economics. The increasing weight of new microeconomics at Oxford is seen as highly influential in the theoretical generalisations made by the discipline, which moved further away from the hitherto empirical approach to the firm.

5.1 A Comparison of the Successive Editions of *Industrial Economics: Theory and Evidence*—A Shift from Industrial Economics to Industrial Organisation 483 484 485 486

The first edition of Hay and Morris' textbook on industrial organisation in 1979 constituted a landmark in the development of the subjects of industrial economics and industrial organisation in the United Kingdom. It served as a basis for teaching even decades after its publication and, as such, exemplified the orientation taken by the discipline at Oxford and more generally in England. In the Preface of the book, Hay and Morris made the objective of their volume explicit:

In recent years Industrial Economics has emerged as a major area of economic analysis both in terms of theoretical and empirical research and in terms of the number of courses at undergraduate and graduate level. This book, stemming originally from lecture and seminar series at both levels, is designed for those pursuing such courses. (Hay and Morris 1979: v)

This first edition was a standard textbook in which industrial economics was described as a field in which debates and controversies were ongoing. It tried to provide students with synthetic overviews of different approaches. In their Introduction, Hay and Morris outlined the difficulty in finding a single definition of industrial economics and raised two particular matters related to it: the disagreements on both theoretical and empirical issues and the

505 confusion over the scope, concepts and methodology of the subject.¹² They
 506 made it clear that industrial economics had emerged as a distinct approach
 507 from the traditional theory of the firm. In particular, they claimed that:

508 First, there is an important sense in which the traditional theory of the firm
 509 represents a long detour in the history of the study of firms' economic behav-
 510 iour. Second, the development of industrial economics can partly be seen as a
 511 consequence of several inadequacies and faults of analysis in the theory of the
 512 firm. Third, while the latter provides a main foundation for the study of indus-
 513 trial economics, several important influences from outside have given a totally
 514 different character to industrial economics. (Ibid.: 4)

515 Nevertheless, while Hay and Morris' approach to firms and industries
 516 rejected the standard version of the theory of the firm, their contribution to
 517 the subject still constituted a break from the Oxford tradition of industrial
 518 economics, as shaped by Andrews and the *Journal of Industrial Economics* of
 519 the 1950s. This judgement is reinforced by comparing the first edition (1979)
 520 with the second edition, published in 1991, under a slightly different title,
 521 *Industrial Economics and Organisation: Theory and Evidence*. The 1979 edition
 522 referred only twice to Andrews' normal cost theory. The first reference
 523 appeared in a chapter dedicated to "pricing behaviour" in which *Manufacturing*
 524 *Business* was mentioned only for its empirical evidence on pricing. The book
 525 was depicted as a series of empirical investigations, which supported the valid-
 526 ity of the cost-pricing principle and tried to incorporate this into a theory of
 527 competition. It is clear, however, that in the authors' minds, Andrews' book
 528 only constituted new evidence to support the 1939 Hall and Hitch article on
 529 pricing. As regards Marshall, Hay and Morris adopted a very cautious
 530 approach while arguing that Post-Marshallians had lost a part of Marshall's
 531 message in dedicating too much work to purely empirical studies. Finally,
 532 they indicated their support for an approach to industrial organisation that
 533 would, once again, combine empirical and theoretical aspects, as Marshall
 534 had done.

535 The second edition of Hay and Morris' textbook confirmed these com-
 536 ments. Andrews was again mentioned infrequently, with *Manufacturing*
 537 *Business* only being considered among various empirical contributions, its
 538 theoretical aspects being completely neglected. Marshall received more or less
 539 the same treatment as he did in the first edition. The main difference between

¹² 'First, as in several areas of economics, there is often disagreement on both the theoretical and empirical issues involved ... Second, and more serious, there is both confusion and conflict over the three main elements of this (or any) discipline—its scope or purpose, its concepts and its methodology' (ibid.: 3).

the editions was in the ebbing of controversy within the field of industrial organisation between 1979 and 1991, mainly because of the increasing domination of game theory in the theory of imperfect competition and strategic interaction. Interestingly, the change in title between the two editions did not merit comment or explanation from the authors. However, the second edition indicated a shift away from empirical studies towards formalisation, which had initially emerged in the United States. Overall, the publication of Hay and Morris' textbook depicted the waning influence of Marshall and to the empirical approach to the firm.

5.2 Developments in Applied Microeconomics and Their Influence on Industrial Organisation (1950s–1980s)

The development of industrial organisation by Hay and Morris was conducted in harmony with advances in general microeconomics. At Oxford, microeconomics was taught at undergraduate level in Philosophy, Politics and Economics (PPE) and at graduate level in the BPhil in Engineering Science and Economics and in the BPhil in Economics. The first microeconomics lecture addressed to PPE students was introduced as late as 1968 and was taught by Peter Oppenheimer. Before then, studies of firms' behaviour were encapsulated in the "Theory of the Firm", "Structures of Industry", "Industrial Organisation", "Theory of Prices", "Welfare Economics" and the "Theory of Demand".¹³ From 1968, microeconomic theory was taught by Oppenheimer and George Richardson to PPE students; by Christopher Allsopp, Nicholas Dimsdale and Laurie Baragwanath to BPhil students in Engineering Science and Economics; and by Richardson, James Mirrlees, Max Corden and occasionally by John Hicks to BPhil students in Economics.¹⁴ The first lectures in the theory of games were introduced in the Hilary term of 1954. This increasing amount of teaching of microeconomics, applied microeconomics and game theory confirms the new orientation taken by industrial organisation, suggested by the successive editions of Hay and Morris' textbook, and reflected

¹³Lectures about the theory of the firm and industries were mainly taught by Andrews and Brunner (1952–1968). John Jewkes was mostly in charge of the lectures entitled "Structures of Industry" (1952–1969) and "Industrial Organization" with Edward Hugh-Jones (1953–1955). "Industrial Organization" was also taught by Norman Leyland (essentially during the year 1954). The "Theory of Prices" was successively taught by Paul Streeten (1952), John Hicks (1952–1953/1958), George Richardson (1953–1954) and Mr Wright (1955–1960). "Welfare Economics" was taught by Hicks (1954–1958/1961–1963); he also taught the "Theory of Demand" (1961–1963).

¹⁴In particular, Hicks taught "Microeconomics IV: 'Value and Capital' Revisited" during the Hilary term of 1970.

569 a general tendency in the mid-1970s and early 1980s towards developing
570 more deductive and normative approaches in the discipline.

571 When Andrews and Brunner left Oxford in 1968, David Stout was left in
572 charge of the BPhil seminar on industrial economics before he, in turn, left
573 Oxford in the early 1970s. Derek Morris then became its organiser and
574 pushed the seminar in a different direction. For instance, in 1974 the seven
575 weeks of the first term were structured as follows:

- 576 1. The principles and significance of company accounts
- 577 2. The profit-maximising hypothesis
- 578 3. Price formation
- 579 4. Game theory and oligopoly
- 580 5. Mergers and concentration
- 581 6. The organisational structure of the modern corporation
- 582 7. Multinational corporations

583 A closer look at the reading lists for each topic shows that Week 2 includes
584 references to Berle and Means (1932), Marris (1964) and Williamson (1964),
585 as contributions to the extension of the profit-maximising hypothesis without
586 referring at all to Hall and Hitch or to any work made by the OERG at
587 Oxford. It has been argued elsewhere that Marris and Williamson developed
588 approaches to the firm supported by concepts of optimum and equilibrium,
589 far from Andrews' interpretation of industrial economics (Arena 2004).

590 As a comparison with the first-term topics examined by the seminar, the
591 programme for the Michaelmas term of 1957 was concerned with industrial
592 economics as defined by Andrews:

- 593 1. Profits in accountancy and in economic theory
- 594 2. Empirical cost functions and their theoretical implications
- 595 3. Competition and the conditions of entry
- 596 4. Competition and the structure of markets
- 597 5. The growth of the firm and the concentration of industry
- 598 6. Oligopolies

599 This Oxford orientation could be contextualised within a broader picture.
600 The introduction of the theory of contestable markets by Baumol et al. (1982)
601 was indeed considered a generalisation of the theory of perfectly competitive
602 markets in which the determination of industry structure was made endoge-
603 nous. According to Baumol, 'in the limiting case of perfect contestability,
604 oligopolistic structure and behaviour are freed entirely from their previous
605 dependence on the conjectural variations of *incumbents* and, instead, these are

generally determined uniquely ... by the pressures of *potential* competition' (Baumol 1982: 2; italics in original). 606
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The concept of "potential competition" that is central to the theory of contestable markets had already been referred to by Marshall and Walras before it was systematised by Baumol and his colleagues as the key to their theory of industrial structures. The new research programme in industrial organisation also highlighted the need to understand economics not only as the production of theoretical knowledge but also as policy. The formulation of a competition policy as needing to maintain the threat of potential competitors in order to ensure the efficiency of new entries/exits contrasted with the structure-conduct-performance paradigm which was clearly more concerned with the stabilisation of structures through insiders' behaviour. This new line of reasoning enlarged the validity conditions of theories of perfectly competitive markets questioned by some industrial economists, especially with the introduction of multi-product firms based on differentiation. 608
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In addition, new models of strategic interaction were also seen as an alternative to standard microeconomics and as a contribution to industrial organisation, as shown in Hay and Morris (1991). Price strategies were now studied in the context of duopolies and oligopolies with the help of emerging modelling techniques. These issues in strategic interaction—developed with an intensive use of game theory—corresponded to a new and substantial methodological element in industrial organisation. 621
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The theoretical and empirical orientation taken by the *Journal of Industrial Economics* after Brunner had left the Editorial Board was also indicative of the increasing interest in applied microeconomics and game theory. In particular, when Hay took over the Editorship, he made a specific effort to align the *Journal's* aims and objectives with research in game theory. He was convinced that such a reorientation was the only strategy that would help to keep the *Journal* successful within the academic community.¹⁵ As a result, the issues published from the beginning of the 1980s became increasingly formalised and less and less empirical in Andrews' initial sense of industrial economics. 628
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6 Conclusion 637

Until the beginning of the twentieth century, economists were mostly focused on the theory of value and of income distribution whereas studies of firms and industries were conducted within the framework of price theory. However, 638
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¹⁵Oral conversation between Brunner and Hay mentioned in an interview with Hay on 18 July 2006, Social Sciences Faculty, University of Oxford.

641 the evolution of management techniques led scholars to shift their attention
642 towards the internal organisation of the firm and industrial dynamics. From a
643 theoretical perspective, the separation of the theory of the firm from the the-
644 ory of value resulted from the Cost Controversy in Cambridge accompanied
645 by a new interpretation of the work of Alfred Marshall.

646 This chapter has shown that Oxford's contribution to industrial economics
647 is not attributable to any specific school of thought that it produced, as could
648 be argued was the case for Cambridge. The lack of emblematic figures at
649 Oxford and/or the relative isolation of successive individuals elected to the
650 Drummond Chair (in particular Edgeworth and Macgregor) did not produce
651 a unified body of knowledge until, perhaps, the innovations made by the
652 OERG which, despite its heterogeneous interests, still paved the way for a
653 more homogenous methodology and theoretical orientation. Hence, although
654 industrial economics today does not resemble the discipline as Philip Andrews
655 knew it, his legacy was to institutionally establish it at Oxford.

656 Oxford took a unique approach to industrial economics due to the OERG
657 and the empirical analysis of the firm, this a reaction to the theory of imper-
658 fect competition popularised at Cambridge in the 1930s. The methodology,
659 in particular the use of questionnaires, was at the time specific to Oxford. The
660 development of industrial economics at Oxford was also strongly influenced
661 by George Richardson and Harald Malmgren who focused on information
662 and knowledge between firms and contributed to a deeper understanding of
663 the organisation of firms. In this way, they shed light on the emergence of
664 more recent knowledge-based economies. The modern evolutionary theory of
665 the firm is based on the concepts of capabilities and competences as proposed
666 by Richardson and Malmgren which views the firm as a complex and organ-
667 ised set of competences and resources that is continuously faced with uncer-
668 tainty. Later on, two key players in the development of industrial economics
669 at Oxford were Donald Hay and Derek Morris, whose *Industrial Economics:
670 Theory and Evidence* served as a foundation for the teaching of the subject and
671 which represented an important manifestation of the direction taken by the
672 discipline at the University.

673 Finally, industrial economics was shaped by the institutions of Oxford
674 itself. The BPhil seminar on industrial economics and the *Journal of Industrial
675 Economics*, both introduced by Andrews in the 1950s, exemplify the applied
676 orientation of the discipline based on an empirical methodology. Saying this,
677 Andrews' influence did later wane with the rise of industrial organisation
678 based on game theory exported from the United States.

Appendix 1: Pre-War Members of OERG

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Name and affiliation	Years in the group	Main research interests	Reasons for departure	t1.1 t1.2
Maurice Allen (Balliol College)	1936–1948	Monetary economics and economic theory	Adviser and Executive Director, Bank of England, 1950–1970	t1.3 t1.4 t1.5
Marian Bowley (OIS)	1936–1937	Industrial economics, especially building material industries	To focus on research into the building material industries	t1.6 t1.7 t1.8
Russell Bretherton (Wadham)	1936–1939	Macroeconomics, especially public finance		t1.9 t1.10 t1.11
Arthur Brown (Hertford)	1936–1939	Industrial economics, applied economics and statistics		t1.12 t1.13 t1.14
Frank Burchardt (All Souls)	1936–1958	Applied economics and statistics; Director of the OIS, 1940–1958		t1.15 t1.16 t1.17
Robert Hall (Trinity)	1936–1947	Macroeconomics, especially consumption and pricing theory		t1.18 t1.19 t1.20 t1.21
Roy Harrod (Christ Church)	1936–1965	Macroeconomics, especially business cycle theory	Never left the Group	t1.22 t1.23 t1.24
Hubert Henderson (All Souls)	1936–1950	Applied economics and statistics		t1.25 t1.26 t1.27
Charles Hitch (Queen's)	1936–1939	Macroeconomics, especially pricing theory		t1.28 t1.29 t1.30
Edward Hugh-Jones (Keble)	1936–1955	Industrial economics and history		t1.31 t1.32 t1.33
Jacob Marschak (OIS)	1936–1939	Applied economics and statistics; Director of the OIS, 1935–1939		t1.34 t1.35 t1.36
James Meade (Hertford)	1936–1937	International economics	Member (1938–1940) and Director (1940–1947) of the Economic Section of the League of Nations	t1.37 t1.38 t1.39 t1.40
Roger Opie (Magdalen/ New)	1936–1964	International economics		t1.41 t1.42 t1.43
Henry Phelps Brown (New)	1936–1947	Labour economics and history	Professor of Economics of Labour at LSE, 1947–1968	t1.44 t1.45 t1.46

(continued)

(continued)

Name and affiliation	Years in the group	Main research interests	Reasons for departure	
Edward Radice	1936–?	Monetary economics; macroeconomics, especially savings issues		t1.47 t1.48 t1.49 t1.50
Richard Sayers (Pembroke)	1936–1947	British monetary economics	Cassel Professor of Economics at LSE, 1947–1968	t1.51 t1.52 t1.53
George Shackle (OIS)	1936–1939	Macroeconomics, especially the theory of uncertainty and business cycle theory		t1.54 t1.55 t1.56 t1.57

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682 Appendix 2: Post-War Members of OERG

Name and affiliation	Years in the group	Main research interests	
Philip Andrews (Nuffield)	1937–1960	Industrial economics, especially the theory of the firm	t2.1 t2.2 t2.3 t2.4
Laurie Baragwanath (St Catherine's)	1961–1965	Microeconomics	t2.5 t2.6
Elizabeth Brunner (Nuffield)	1948–1960	Industrial economics, especially the theory of the firm	t2.7 t2.8
Frank Burchardt (All Souls)	1936–1959	Applied economics and statistics; Director of the OIS, 1940–1958	t2.9 t2.10
David Champernowne (OIS)	1948–1959	Macroeconomics, especially unemployment issues	t2.11 t2.12
Norman Chester (Nuffield)	1948–1949	Politics and unemployment issues	t2.13
Henry Clay (Nuffield)	1948–1950	Macroeconomics, especially unemployment issues	t2.14 t2.15
Theo Cooper (St Hugh's)	1964–1965	Public finance	t2.16
John Fforde (Nuffield)	1950–1959	Monetary economics	t2.17
Terence Gorman (Nuffield)	1963–1964	Mathematical macroeconomics	t2.18
Margaret Hall (Somerville)	1948–1962	Industrial economics	t2.19
Eric Hargreaves (Oriell)	1948–1959	Industrial economics	t2.20
Roy Harrod (Christ Church)	1935–1965	Macroeconomics, especially business cycle theory	t2.21 t2.22
Arthur Hazlewood (Pembroke)	1963	Development economics	t2.23 t2.24
Hubert Henderson (All Souls)	1935–1959	Statistics and applied economics	t2.25 t2.26
John Hicks (All Souls)	1950–1965	Trade cycle theory	t2.27

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(continued)

(continued)

	Name and affiliation	Years in the group	Main research interests
t2.28	Edward Hugh-Jones	1935–1955	Industrial economics and history
t2.29	(Keble)		
t2.30	John Jewkes (Merton)	1950–1959	Industrial economics
t2.31	Charles Kennedy (Queen's)	1950–1959	Macroeconomics
t2.32	Kenneth Knowles (OIS)	1960–1962	Labour economics
t2.33	Norman Leyland	1950–1965	Industrial economics
t2.34	(Brasenose)		
t2.35	Ian Little (Nuffield)	1960–1964	Macroeconomics
t2.36	Donald MacDougall	1950–1959	Macroeconomics, especially trade cycle theory
t2.37	(Nuffield)		
t2.38	Grigor McClelland (Balliol)	1963–1965	Management studies
t2.39	Denys Mundy (Nuffield)	1960–1964	Macroeconomics
t2.40	M.E. Paul	1963–?	Macroeconomics
t2.41	George Richardson (St	?–1965	Microeconomics, especially the
t2.42	John's)		information theory of the firm
t2.43	Derek Robinson (OIS)		Macroeconomics
t2.44	Dick Sargent (Worcester)	1950–1959	Applied macroeconomics
t2.45	Maurice Scott (Nuffield)	1960–1965	Macroeconomics, especially economic growth
t2.46			
t2.47	David Stout (University)	1960–1965	Industrial economics, especially the theory of the firm
t2.48			
t2.49	Paul Streeten (Balliol)	1961–?	International macroeconomics
t2.50	Peter Vandome (OIS)	1964	Econometrics
t2.51	Charles Ward-Perkins	1950–1959	Economic history
t2.52	(Pembroke)		
t2.53	Tom Wilson (University)	1950–1959	Industrial economics, especially pricing policy
t2.54			
t2.55	David Worswick	1964	Statistics
t2.56	(Magdalen)		
t2.57	John Wright (Trinity)	1960–1965	Industrial economics

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Queries	Details Required	Author's Response
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Thank you.**

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