

EDITH T. PENROSE: ECONOMIST OF ‘THE ORDINARY BUSINESS OF LIFE’¹

Jason M. Pattit

Opus College of Business
University of St. Thomas
1000 Lasalle Avenue
Minneapolis, MN 55403
PH: 651-962-4309
patt2744@stthomas.edu

Katherina G. Pattit

Opus College of Business
University of St. Thomas
1000 Lasalle Avenue
Minneapolis, MN 55403
PH: 651-962-4283
glac6548@stthomas.edu

J.-C. Spender*

Kozminski University
Warsaw, Poland
jcspender@gmail.com

Keywords: Penrose’s language of the firm; the theory of the growth of the firm; business ethics

* Corresponding Author

¹ Alfred Marshall’s definition of economics was the “study of mankind in the ordinary business of life” (Marshall 1969: 1), quoted in E. T. Penrose (2009: 234).

EDITH T. PENROSE: ECONOMIST OF ‘THE ORDINARY BUSINESS OF LIFE’

Abstract

When Edith T. Penrose became Fritz Machlup’s student in the late-1940s, she found little in mainstream or Austrian economics to guide her as she began her explorations into the growth of the firm. While she acknowledged Kenneth Boulding’s influence on her work, we suspect she drew on a broader tradition that includes, among others, Alfred Marshall, Frank Knight (Boulding’s teacher), and Ronald Coase. We seek to demonstrate Penrose’s connection to this ‘invisible college’, particularly to Knight, and its influence on her investigation of the growth of the firm. Given mainstream economists’ pursuit of rigor at the expense of practical relevance and their continuing inattention to Coase’s work, we suggest Penrose’s work on the growth of the firm can be understood as part of a broader tradition represented by this ‘invisible college’, lending to useful new insights for business strategy and business ethics scholarship.

EDITH T. PENROSE: ECONOMIST OF ‘THE ORDINARY BUSINESS OF LIFE’

“If all meanings could be adequately expressed by words, the arts of painting and music would not exist” (Dewey, 2005: 77)

In this paper, we explore Edith T. Penrose’s (ETP) intellectual sources, particularly the unremarked upon links between ETP’s work and the ideas of Frank H. Knight (FHK). We believe ETP’s oeuvre is better understood and appreciated if it is considered as part of an ‘invisible college’ that includes others such as Alfred Marshall, FHK, and Ronald Coase. This claim may seem odd given that ETP was Fritz Machlup’s student. However, rather than having a direct theoretical influence on ETP’s writing, Machlup’s mentorship can be seen most strongly in the clarity and structure of her work and her attention to detail, particularly in *The Theory of the Growth of the Firm* (TTGF). Machlup gave her a methodological framework for structuring her research and findings (Connell, 2007, 2009).

While the scholars comprising our ‘invisible college’ differed in many respects, they shared a commitment to explore the limits of rigorous theorizing in sociology and economics. However, they were not trending towards today’s positivist rigor, even as many see FHK as its architect, the shaper of the Chicago School (along with Jacob Viner) and George Stigler’s and Milton Friedman’s teacher (Backhouse, 2004: 203; Emmett, 2009; Van Horn, Mirowski, & Stapleford, 2011). ETP was also well-aware of the limits to formal theorizing about the ‘ordinary business of life’ and its economics (e.g., E. T. Penrose, 1958), a view that she shared with Coase and FHK (e.g. Coase, 1964; Knight, 1924). Thus, our claim is that ETP was a member of an ‘invisible college’ that was interested in advancing an ethically infused, politically conscious economics that could better serve society’s needs and that she was not the isolated scholar with a *de novo* approach that some suggest.

Connecting ETP to this ‘invisible college’, particularly with FHK, is complicated. ETP

made no known comments about FHK's ideas. Citations were sparse; FHK's *Risk, Uncertainty, and Profit* (RUP) was cited only twice and without comment in the footnotes of TTGF (E. T. Penrose, 2009: 50n57, 69n77). There was nothing further on FHK in ETP's *oeuvre*, nor was FHK's work discussed by commentators on ETP's work (e.g. Foss, 1999; Lazonick, 2002; Loasby, 1999, 2012). Direct citations with comment on Boulding, FHK's student, are slightly more forthcoming (see E. T. Penrose, 2009: 5n6, 10n9, 24n25, 29n34, 135n158), but the record is incomplete at best. There is no evidence of ETP's broader engagement with FHK's work. Thus, our task is to tease out linguistic similarities in search of tantalizing clues that demonstrate the influence of this 'invisible college' on ETP's work.

The remainder of this paper proceeds as follows. First, we highlight some important events in ETP's life prior to beginning her doctoral studies under Machlup at Johns Hopkins University (JHU), providing historical context for our discussion of ETP's immersion into the available literature on the 'theory of the firm' (ToF). Then we discuss ETP's work leading up to TTGF, delving into the evolution of her own ToF, followed by an examination of her novel language and its implications. We then discuss ETP's membership in an 'invisible college' that includes Marshall, FHK, and Coase. Finally, we examine perhaps the profoundest axiom of ETP's language, her separation of 'services' from 'resources', and explore how this relates to FHK's earlier ideas.

ETP's Formative Years

Many reading TTGF today, especially if they presume it was ETP's PhD thesis under Machlup at JHU, may also presume she knew little about economics before she began her studies with him in 1947. They would be wrong on both counts. What follows is a brief account of ETP's life up until she arrived at JHU. Unless otherwise noted, the information in this section is

from ETP's biography written by her daughter-in-law Angela (see A. Penrose, 2018).

From 1932 through 1936, ETP was an undergraduate student at UC Berkeley, majoring in economics. Against college rules, she "secretly" married David Denhardt, a law student, in 1933. As an undergraduate, ETP was active in student government and the university's debating societies. She was also involved with several activist groups on campus concerned about labor rights. Along with Denhardt's brother, she and other like-minded students assembled the Sentries of American Youth. ETP played a prominent role in the open forum that the group organized to discuss the issues surrounding the general strike by San Francisco Bay workers in 1934.

In her final year at Berkeley, she began to attend the lectures of Ernest Francis Penrose (Pen), a leading agricultural geographer and economist (E. F. Penrose, 1934). In the summer of 1936, ETP became Pen's assistant, typing letters, organizing courses, and especially helping with research. After graduation, ETP remained in Berkeley to continue her work with Pen, while her husband headed to Colusa, California to begin working as an assistant district attorney. Of note, ETP worked closely with Pen on two demanding projects, the California Medical-Economic Survey and a study on Japanese economic development that was being edited by Elizabeth Boody Schumpeter, the wife of Joseph Schumpeter.

In early-1937, ETP finally left Berkeley to join her husband in Colusa, but she remained in contact with Pen. Pen's letters to ETP detailed his struggles with the California Medical Association and its unwillingness to publish the findings of the Medical-Economic Survey, while ETP's letters to Pen shared her struggles adjusting to life away from the university. In early-1938, ETP and her husband moved to the small town of Williams, California. Soon after, Denhardt announced his intentions to run for district attorney. On August 1, 1938, he was killed while hunting with colleagues from the district attorney's office.

After this tragedy, Pen offered ETP an opportunity to work for him at the International Labor Organization (ILO) in Geneva. Leaving her new-born son David in California with her parents, ETP departed for the ILO where she became involved in international economic policy at the highest-level during World War 2. Of note, ETP led the study of and authored a report on food policy in the United Kingdom while she and Pen were stationed in London during the War (see Denhardt, 1943). By May 1946, she had married Pen and returned to the U.S. with their two new children, Perran and Trevan. In New York, ETP worked closely with Eleanor Roosevelt on the *Universal Declaration of Human Rights*. In 1947, Pen became Professor of Geography and International Relations at JHU. Perhaps the prospect of being a faculty wife provoked ETP to begin her own academic career with an MA; but she was no novice. To the contrary, from her work with Pen at Berkeley and the ILO, and with Eleanor Roosevelt, ETP was a widely experienced, self-directed economic researcher who had come into contact with many of the world's leading economists, including Friedrich Hayek, Lionel Robbins, Austin and Joan Robinson, John Jewkes, John Maynard Keynes, and Joseph Schumpeter.

Given ETP's legendary discipline, work ethic, activist background, and international experience, it was surprising she had no specific 'research question' in mind. Lacking this, she joined the newly arrived Machlup on his project on the economic impact of patents (Machlup, 1958, 1962). Her 1948 MA thesis was titled *Discussion of Patents in Economic Doctrine*. Machlup was impressed and collaborated with ETP on "The Patent Controversy in the 19th Century" (Machlup & E. T. Penrose, 1950). ETP extended this into her dissertation, published as *The Economics of the International Patent System* (E. T. Penrose, 1951), which attracted positive attention. Pitelis (2000) suggested it affirmed ETP's early interest in monopoly, innovation, and social welfare.

ETP was appointed as a Research Associate in 1950 and Lecturer in 1951 in Political Economy at JHU, teaching the social control of industry, monetary economics, and international economics. Machlup mentioned ETP in a footnote in his paper to the 1951 *Round Table Conference on Monopoly, Competition, and their Regulation*, attended by FHK and the Robinsons, acknowledging ETP's 'valuable contributions' (Machlup, 1954: 387n4). However, with a further new son Trevear and poor salary, it is unlikely she attended the conference. Lacking any specific interest in firms but needing to earn some money, ETP subsequently joined a study of the growth of business firms funded by the Merrill Foundation for the Advancement of Financial Knowledge. It was co-managed by G. H. Evans, Jr., chairman of the Economics Department, and Machlup.

The ToF Literature in the Early 1950s

After joining the project, ETP settled into nine months of reading and thinking, concluding that the traditional ToF was not very relevant to theorizing the growth of the firm (Parkin & King, 1992; P. Penrose & Pitelis, 1999: 5). In the *Foreword* to the 3rd edition of TTGF, she recalled that "a definition of a firm with 'insides' was required – a definition more akin to that used by economists working on the structure of industry, such as Alfred Marshall or E. A. G. Robinson, and by those from other disciplines treating the firm as an organization" (E. T. Penrose, 2009: 235).

What was the ToF literature that ETP read and dismissed as she began her research? Machlup's Presidential address to the American Economic Association in 1966 provides some insight into what she might have read and discussed with him (Machlup, 1967). His address recalled the disciplinary conflicts of the 1940s about whether marginalist ToFs should be displaced or merely supplemented by the newer, 'more realistic' managerial and behavioral

theories that had emerged since the 1920s. He likened the conflict to another Methodenstreit (Machlup, 1967: 3). He concluded economics had fragmented into a plurality of incompatible theories, each with some merit. He sketched ten and commended researchers to use the one best suited to their purpose.²

The variety of theories available was also obvious to ETP. She noted “[t]he firm is by no means an unambiguous clear-cut entity” (E. T. Penrose, 2009: 9). Like Machlup, she was aware each analysis reflected its author’s purpose. Most mainstream economists thought of the firm as ETP defined it: “an administrative organization and a collection of productive resources; its general purpose is to organize ... the production and sale of goods and services at a profit” (E. T. Penrose, 2009: 28). Unlike her mainstream colleagues, she saw this definition as the beginning of an enquiry into firms and managing them, not an end. Every term used – administrative, organization, sale, goods, and, especially, resources – begged questions. Absent physical definitions (i.e., an underpinning ontology), all were assumptions woven into a net of language deployed to catch analysts’ ideas about firms. Better assumptions would open their enquiry to new insights; bad assumptions would shut it down, promoting tautology, poor thinking, and poor policy.

One ToF story is of ‘Smithian’ enterprises and goes back centuries, presuming owner-managers set up firms and coordinate the ‘division of labor’ directly, by ‘fiat’ rather than by ‘truck, barter, and exchange’ (Best, 2012). ETP accepted the division of labor as basic. She presumed it was coordinated by ‘authoritative communication’, a term she borrowed from Chester Barnard (Barnard, 1938; E. T. Penrose, 2009: 17n17). Organization theorists took up this model, typically through the prism of Max Weber’s bureaucratic theory. Its history was of

² Curiously, he did not cite TTGF or mention ETP in his address. This curious omission was noted in Lazonick (2020).

increasing elaboration and sophistication. In this view, firms are also seen as ‘organizations’, along with other non-economic groups such as churches, hospitals, and football leagues. ETP also drew on the Carnegie School’s ideas about managerial knowledge and behavior (E. T. Penrose, 2009: 15n15, 28n33).

Another story saw ‘the firm’ as a domain of the socially, ethically, and politically legitimated managerial power that emerged from the European guilds (Greif, 2006; Ogilvie, 2011). In this view, the firm was regarded as a community of power specific to its participants. Managers’ power within their firm did not imply any power beyond the firm, in other communities. In this story the firm was an idiosyncratic ‘private’ zone separated from the polity and socio-economy beyond, where other more public systems of power, markets, and social arrangements pertained. D. H. Robertson’s metaphor, quoted by Coase, was of firms as ‘islands of conscious power in this ocean of unconscious co-operation like lumps of butter coagulating in a pail of buttermilk’ reflected this perspective (Coase, 1937: 388).

ETP would have also likely been familiar with the history of the ToF recounted later by Harold Demsetz (Demsetz, 1988). In this story, from the time of Adam Smith until the 19th century, economists’ principal focus was on ‘price theory’ and how markets function. According to economists working in this tradition, well-functioning markets maximized society’s economic benefits. But this undercut considering firms as alternative ‘problem solving institutions’ (i.e., alternative to markets). The mainstream analysis was of causes (prices) and consequences (trades). Firms had no significant features beyond their price-making or price-taking.

Demsetz argued FHK and Coase broke the orthodox view of firms apart by re-imagining them as alternative modes of social organization. FHK and Coase’s chisel was ‘uncertainty’, ushering in a new generation of economists who saw firms as uncertainty-bearing institutions.

Entrepreneurial judgment was the key resource able to ‘bear uncertainty’, ill-conceived as a price-able factor of production. Demsetz’s telling reflected his own theoretical agenda, for he argued that there was no great difference between arrangements within firms and within markets, trashing the distinction as ‘delusion’ (Alchian & Demsetz, 1972: 777). Thereby, while Alchian and Demsetz theorized about ‘teamwork’, their arguments reinforced the mainstream economists’ view that firms were creatures of market-defined characteristics only; that other aspects were irrelevant.

Nicolai Foss’s work provides a good window into the ToF literature ETP likely encountered (e.g., Foss, 1991, 1994, 1998; Foss & Klein, 2006; Foss, Lando, & Thomsen, 2000). Rather than beginning with Adam Smith and a free-market focus, Foss took off from Thorstein Veblen’s critique of mathematical economics (Foss, 1991: 64; Veblen, 1898). Veblen was a student of John Bates Clark, who developed a brutally competitive Darwinian view of economic activity. Veblen explored the limits of Clark’s view, especially given the socially beneficial effects of well-built institutions. Veblen became a ‘Father of American Institutionalism’ and called for an evolutionary approach. His critique aligned with Alfred Marshall’s, bearing in mind the ‘folklore view’ of Marshall as the ‘Father of Marginalism’ was ‘grossly inaccurate’ (Foss, 1994: 1116; Raffaelli, 2003).

Foss’s story goes on to note that technical problems with naïve ‘economies of scale’ led inter-war micro-economists to re-think firms as instances of imperfect competition, leading to the ToFs of Edward Chamberlin, Joan Robinson, and Robert Triffin. Foss (1994) deemed that these unproductive diversions ensured that economists failed to embrace evolutionary ideas. However, politics also came into play. There were urgent debates about firms as legitimated instances of entrepreneurs’ evident freedoms to create monopolies, tilting the balance between

government controls, the citizenry, and free competition. For example, Adolf Berle and Gardiner Means drew attention to the separation of corporate ownership and control and how it put managements' freedoms at the center of a discussion about business's political power (Berle Jr & Means, 1932). As the economy evolved, firms seemed to acquire two differing modes of existence, (i) as politically powerful actors and (ii) as zones of non-democratically bounded managerial power. The second was bleeding into the first, leading to managers exercising political powers for which they were not held accountable.

Another way to appreciate Foss's analysis is to track what happened to Marshall's 'representative firm' as it was criticized by Robbins (1928) and finally displaced by Arthur Pigou's 'equilibrium firm' (Pigou, 1928: 239). Marshall's famous metaphor was of firms as heterogeneous trees that comprised a forest, their industry (Foss, 1994: 1118; Marshall, 1969: 263). His metaphor was carefully chosen to relate a number of evolving firms, each with its own character and lifecycle, some prospering, some not, to their stable industry (Raffaelli, 2003: 109). Whereas Marshall saw every real firm as unique and different, his representative firm was an 'ideal type' for analytic purposes. The representative firm was "one which has a fairly long life, and fair success, which is managed with normal ability, and which has normal access to the economies, external and internal, which belong to that aggregate volume of production" (Marshall, 1964: 180; 1969: 265).

Marshall's representative firm was an intermediate analytic entity interposed between (a) the heterogeneous real firms that he had observed during his frequent 'industrial wanderings' (Whitaker, 1975), and (b) the equilibrium of a real industry. The representative firm was pivotal to his attempt to synthesize his intuitions into a formal system of economics. Thus "it explains why Marshall's concept of industry equilibrium has no room for an equilibrium firm" (Foss,

1994: 1119). Pigou's 'equilibrium firm' eviscerated Marshall's idiographic firms, replacing them with a generalized marginalist 'black box', without internal characteristics, defined solely by market prices. This eviscerated model was likely what ETP encountered as she read into the ToF literature. It was nomothetic and devoid of idiographic particularity. Coase would later dub it 'blackboard economics' (Coase, 1964; Medema, 1995). All discussion of a firm's unique nature was silenced.

Developing Her Own Language

As noted in the previous section, ETP's reading led her to conclude the traditional ToF did not illuminate the growth of firms (Parkin & King, 1992; P. Penrose & Pitelis, 1999). Somewhat to her own astonishment, after years of analyzing and reporting others' empirical data and thinking, she began to develop her own ToF, one fashioned to her investigation into their growth. As Buckley and Casson (2007) summarized, in the end, ETP dismissed the idea that the size of a firm could be explained via the interplay of its economies and diseconomies of scale, arguing instead that it hinged on interacting 'economies of growth'. In this section, we delve into the evolution of the language she developed over the course of the 1950s to capture this intuition, especially the agency inherent in managers' drive, imagination, learning, and teamwork, culminating in the publication of TTGF in 1959.

The first fruits of ETP's efforts appeared in a squabble over biological models with Armen Alchian (Alchian, 1950, 1953; E. T. Penrose, 1952, 1953). She faulted Alchian for excising human agency, though without offering a competing theory of her own and following, without citation, Allyn Young's argument (Young, 1925: 157). Her analysis took off from the lifecycle analogies found in Alfred Marshall's evolutionary writings and from Kenneth Boulding's fondness for biological models (E. T. Penrose, 1952: 805 [nn 2,3]; 2009: 234).

Ironically, ETP saw how the lifecycle ToF might appeal to microeconomists because it gave every firm a unique non-market-defined character – its age. She concluded, however, that it came at too high a price, erasing the managers’ entrepreneurial agency: “The development of firms does not proceed according to the same ‘grim’ laws as does that of living organisms.” (E. T. Penrose, 1952: 806). Rather, she suggested that a firm’s growth could only be understood as the consequence of its managers’ decisions, bringing their agency front-and-center. “We know of no general laws pertaining to men’s choices, nor have we as yet any established basis for the existence of such laws.” (E. T. Penrose, 1952: 808). On the same grounds she dismissed two variants of biological theory, viability and homeostasis.

ETP’s focus on managerial agency meant dismissing the mainstream’s market- and equilibrium-based notions. Consequently, the firm’s growth might then be driven endogenously by the managers’ imagination and learning, as well as by taking advantage of market imperfections and the firm’s market power. *Inter alia*, ETP’s interest in evolution led her to focus on ‘process’ versus ‘structure’, a distinction explored in today’s agency-structure debates (e.g. Archer, 2003). ETP’s 1952 paper began to deploy her new ToF language; key was the claim that a firm’s growth was driven by its managers, and limited only by their skills and capacities (E. T. Penrose, 1952: 808).

“Limits to the Growth and Size of Firms” (LGSF) followed and used most of the language deployed and further elaborated in TTGF (E. T. Penrose, 1955). Central was her novel ‘theoretical’ distinction between ‘economies of size’ and ‘economies of growth’, rejecting marginalist analyses based on economies or diseconomies of scale. This distinction also played into her view that, being based on an inappropriate economics, antitrust policy was flawed. Lacking a relevant economics, policy-makers fixated on the political downsides of monopoly

power and denied themselves insight into the possible benefits of bigness, especially when it came to the research that led to innovation and patents (E. T. Penrose, 2009: 229). Her anti-trust policy views were echoed, though from a different political viewpoint, by Oliver Williamson, after his time with the Antitrust Division in 1966 (Williamson, 1986: xv). Williamson's analysis had an impact on U.S. policymakers that Penrose's did not.

Working on LGSF helped ETP sharpen her research question, which she re-expressed in the *Foreword* to the 3rd Edition of TTGF as “whether there was something inherent in the very nature of a firm that both promoted its growth and necessarily limited its rate of growth” (E. T. Penrose, 2009: 235). Her conclusion; growth was not driven by superior resources or comparative advantage. Rather, it was driven by managers' interests and skills. ETP's contrast of economies of scale and of growth was radical. It implied there was no optimum firm size, nor ultimate limit to a firm's growth; a shocking conclusion with political implications (E. T. Penrose 2009: 240). The marginalist, 'black-box' ToF proved inadequate to analyzing firm growth. Rather than save marginalist language, ETP strove to theorize disequilibrium and learning. Portending a theory of entrepreneurship, managing growth was not the same as managing steady state or competitive equilibrium. Likewise, growth by acquisition and by innovation were different, raising new questions about monopoly that ETP sketched in the final chapters of TTGF (Blundel, 2015).

ETP's new language was evident in LGSF but it was further developed as she worked diligently to finalize the manuscript for TTGF over the subsequent years. The context within which ETP worked during this period was key to the evolution of her language. First, in 1954, funded by the *Foundation for Economic Education*, ETP spent six weeks on-site in discussion with the managers of the Hercules Powder Company. Hercules had been spun off from Du Pont

in a 1912 Antitrust decision. By the mid-1950s, it had become a conglomerate, engaged in radical innovation, diversification, and acquisition. ETP intended to publish her casework on Hercules as part of TTGF but it was excised by the editors against her wishes and only published later (E. T. Penrose, 1960).

Then, in May 1955, ETP and family then moved from JHU to Australia on a 'leave of absence'. While in Melbourne, ETP spent "a most interesting 3 days talking to the really big shots of Australian firms" (A. Penrose, 2018: 144). Her discussions with these executives, including those from General Motors-Holden, the wholly owned subsidiary of General Motors. The seminars that she conducted while in Australia greatly encouraged her. As she noted in a letter to Machlup her "line of reasoning about things stood up beyond my expectations" (A. Penrose, 2018: 144).

ETP and family then returned to the US in late-1955. She was elected to JHU's General Assembly in October 1956, securing her lectureship. However, unhappy with the political situation in the US, Pen and ETP decided to go to Baghdad to help establish a new academic institution. In September 1957, ETP arrived in Baghdad, the TTGF manuscript still incomplete (A. Penrose, 2018: 153). Remarkably, given her heavy teaching and administrative loads her thinking was enriched by new analyses of the oil industry, visiting the Kirkuk oil fields, and her discussions with oil industry executives and national administrators, especially about the industry's political role and constraints (A. Penrose, 2018: 156,157).

Reminiscent of Marshall's 'industrial wanderings', ETP's interaction with the managers from the Hercules Powder Company, General Motors-Holden, and the multinational oil companies in Iraq provided her with an opportunity to observe real firms at work, rather than simply theorizing about them from her office. By analyzing managerial interests, capabilities,

and the language the managers used, she was able to examine and refine the language she had been developing for describing growing firms. Rather than trying to develop a nomothetic ToF, ETP chose instead to treat firms as idiographic and to capture their uniqueness. Perhaps her interactions with executives also inspired her to read Chester Barnard's 1938 book, which had not been cited in LGSF.

In TTGF, ETP's economics would stand on the specific firm's managers' knowledge and entrepreneurial agency, most famously on their capability to transform its resources into services. Rather than using historians' time, the firm's entrepreneurial or strategic time would be measured by the managers' 'learning'. Few economists, Smith and Marshall being obvious exceptions, had the intellectual heft and disciplinary courage to attempt such an argument, in part because they could then not avoid addressing the ethical and policy implications of the specific managers' choices (E. T. Penrose, 1952: 809). ETP's 'economizing' entailed ethical choices.

Understanding ETP's New Language

In this section, we examine the language ETP developed in LGSF and expanded in TTGF. Our examination begins with a discussion of a series of papers by Yasemin Kor, Joseph Mahoney, and their colleagues, in which they successfully unpack TTGF's vocabulary (Kor & Mahoney, 2000; Kor & Mahoney, 2004; Kor, Mahoney, & Michael, 2007; Kor, Mahoney, Siemsen, & Tan, 2016). We then present our own interpretation of TTGF's vocabulary, culminating in 15 axioms that capture the essence of the new language ETP developed for describing the firm.

In a 2016 paper, Kor and colleagues discuss ETP's intellectual sources which are similar but not identical to the influences we note, including P. Sargent Florence (as a connection to Marshall) and Walter Heller (see Heller, 1951). Using a 'subjective' and 'interpretive', rather

than ‘positivist’, methodology, they identify 14 distinct ideas underpinning ETP’s language, highlighting the words, terms, and meanings that underpin her discourse. Social studies have seen a recent ‘turn to rhetoric’, something of a rebalancing away from rigorous positivist methods (Barglela-Chiappini, 2009; Cooren, Kuhn, Cornelissen, & Clark, 2011; Hardy, Lawrence, & Grant, 2005; Simons, 1990). This turn is not so much novel as a recovery of an earlier ethnomethodological tradition that formed a part of the pluralistic approach to economics J. N. Keynes expounded in *The Scope and Method of Political Economy*.

At Marshall’s behest, J. N. Keynes (1890) argued a ‘useful’ economics required three complementary languages: (a) rigorous theorizing, (b) knowledge of the context’s political economy and history, and (c) attention to the arts of economic practice - in short, mathematics, history, and art, the latter two of which lie beyond the grasp of positivist science. ETP’s analysis of her research question, “whether there was something inherent in the very nature of a firm that both promoted its growth and necessarily limited its rate of growth” (E. T. Penrose, 2009: 235) shows J. N. Keynes’ three languages. For example, ETP uncovered a general tendency, dubbed the ‘Penrose Effect’, that indicates that the rate of firm growth is restricted by the rate of managerial learning. However, she also recognized the rate of managerial learning is shaped by the idiosyncratic decisions made previously by management; in other words, by the firm’s ‘very nature’. Thus, ETP displays the tension between the search for generalities and the need to pay attention to the specifics (i.e., context and history) in any ‘useful’ economics.

Kor and colleagues go on to list various attempts to formalize ETP’s ideas, underscoring the mainstream’s obsession with shoehorning her thinking into a rigorous, mathematical format. Interplaying qualitative axiom discovery with quantitative or formal hypothesis testing is a legitimate academic activity, much evident in our research literature. But it was not what ETP

was up to. Rather, she stated that “[e]ach analyst is free to choose any characteristics of firms that he is interested in, to define firms in terms of those characteristics, and to proceed thereafter to call the construction so defined a ‘firm’” (E. T. Penrose, 2009: 9), highlighting her project’s relativism and subjectivism. Thus, in LGSF and especially in TTGF, she sketched a language generic enough to help entrepreneurs think through the connections between managerial experience, learning, firm growth, and the constraints to growth.

Our contention is that the language ETP developed in TTGF is about extending and facilitating entrepreneurial choice. For an entrepreneur to exercise choice, there must be ‘opportunity spaces’. ETP focused on searching for these at the ‘interstices’ between the economy’s existing businesses (E. T. Penrose, 2009: 194). In these spaces, managers can draw upon their entrepreneurial imagination. However, theorizing about entrepreneurial imagination is fraught, pointing to the boundaries between reasoning and whatever alternative modes of knowing we presume. Imagination can only be illuminated by identifying the contextual (i.e., social, technological, legal, economic) constraints within which the imaginer’s freedoms arise and might be exercised. These constraints are both external and internal, both objective and subjective. Imagining is also shaped by the imaginer’s interests and ethics. We suggest ETP’s discussion of opportunities, constraints and interests provide a loose but general ‘recipe’ for entrepreneurial activity in a capitalist democracy (E. T. Penrose, 2009: 5).

Since each recipe is synthesized into a ‘coherent whole’ by the entrepreneur adopting it, each aspect complementing every other, it does not matter how we begin to unpack it (Spender, 2014). Rather than follow ETP’s sequence in TTGF, we economize and list her axioms as Kor and colleagues did. This is not simply positivistic reductionism. Rather, it is the search for a ‘natural language’ of entrepreneurship adapted to a specific context. Ultimately every axiom

chosen is a distinction between alternative statements that can be useful in that context.

1. Economies of growth versus economies of size
2. Dynamics of open evolutionary real-world processes versus abstracted decisions about structure and design
3. Nature of human heterogeneity, the unique idiography of our practices, and of the heterogeneity of relevant managerial capabilities
4. Managerial capabilities that transform heterogeneous resources into the heterogeneous services valuable in that situation
5. Each managerial capability's finiteness and indivisibility
6. The practical and mathematical impossibility of perfectly matching a finite bundle of resources to a finite need
7. Managers deploy various services to meet various needs, and such practices may lead them to develop new capabilities
8. An actors' perceptions of time (and history) are learned and shape future perceptions
9. Under-utilized resources and capabilities always press entrepreneurs towards their further application, so driving growth shaped by their interests, or they wither
10. Managers' mental capacity to create new capabilities becomes a limiting or 'strategic' constraint to growth
11. Entrepreneur's capabilities and choices can be extended and institutionalized into 'a firm' by decentralization and delegation
12. The resulting division of labor is shaped and directed through 'authoritative communication'
13. The individual entrepreneur's creative capacities can be extended by forming a

‘management team’

14. A team’s capabilities are limited by its rate of learning and its rate of adding and institutionalizing new members, further defining the firm’s time scales.

15. *Natura non facit saltus* (nature does not make leaps, or change is continuous)

The Invisible College

In the previous section, we discussed the language ETP developed in LGSF and TTGF. It can be understood as a general ‘recipe’ for entrepreneurial activity in a capitalist democracy. In this section, we explore how ETP’s language connects her to the ‘invisible college’ of economists interested in advancing an ethically infused economics that could better serve society’s needs. For convenience, we label this project to create an economics of the ‘ordinary business of life’ the Marshall-Knight-Coase-Penrose (MKCP) project. While learning from predecessors such as Darwin, Smith, Spencer, and Turgot, as well as contemporaries like Commons, Menger, Pareto, Schmoller, Weber, and Young, the college’s project was specific: an economics that could serve entrepreneurs within a capitalist democracy. It presumed the private firms created were (a) beneficial to those impacted and (b) socially and politically legitimate.

No investigation of a researcher’s methods can ignore questions about their purposes; ‘why this method?’ Marshall was a complicated case. Not only a pluralist, he pursued a plurality of objectives, striving for both usefulness and rigor. Rather than being ambivalent about the possibility of a ‘science of economics’, he maintained it could never be more than part of human understanding (Raffaelli, 2003; Raffaelli, Becattini, & Dardi, 2006). Thus, as noted earlier, in the shadow of the *Methodenstreit* he encouraged J. N. Keynes to write *The Scope and Method of Political Economy* to demonstrate that pluralism could be a viable path in the study of economics (Moore, 2003). His book became the leading British methodological text for economists in the

early-20th century.

Following Marshall, FHK also had hopes for the possibility of a rigorous science of economics (Knight, 1924, 2006). However, he saw uncertainty and judgment as concepts that limited rigorous theorizing. Greatly influenced by his mentor, Allyn Young, FHK's work focused on economic institutions or 'social organizations' (e.g., Knight, 2013). While many economists saw only markets and economic actors, FHK saw markets as but one of the many types of economic institutions history revealed arising, created for differing purposes. FHK's interest in markets stemmed from the novel social and political freedoms they provided. He recognized markets could not be a society's only economic institution. He also argued 'every economic choice was ultimately a matter of ethics' (Boyd, 1997; Emmett, 2009: 98; Knight, 1922). Thus, he saw economics as the study of the alternative, politically-available economic institutions so as to compare their social benefits (Emmett, 2010; Knight, 2013: 5).

FHK's study of alternative economic institutions led him to conclude that if there was a rigorous science of economics, there could be no place for institutionalized knowledge or process. There would be no uncertainty and the analyst would be in the condition of 'perfect knowledge', the condition most neoliberal economists admit feasible. FHK suspected neither firms nor markets could exist under this condition. Hence, in contrast, presuming uncertainty characterized the 'ordinary business of life', FHK intuited the possibility of real firms, real markets, and real 'business ethics'. Thereby he laid the groundwork for Coase's comparison of markets and hierarchies. FHK and Coase saw economics, social purpose, and personal ethics as wrapped intimately together.

Following J. N. Keynes's prescription, the MKCP project's economics would take up such rigorous science as could be brought to bear, given the firm's processes are in the physical

world, not mere abstractions of mind. However, as the economics professions' methods changed, so did its purposes. Eventually, this user-oriented (and ethically infused) project was overtaken by the profession's hunger to ape natural science's rigorous (and non-ethical) methods (Mirowski & Nik-Khah, 2017). Note Milton Friedman's *Methodology of Positive Economics* took off from Keynes's book by dismissing history and art, narrowing Marshall's pluralism into today's monism (Friedman, 1953).

What is ETP's connection to the other members of this 'invisible college'? She was clearly moving against the trend to rigor, searching for a 'useful' analysis, but 'useful' to whom: managers or economic theorists? Commenting in 1995, ETP was encouraged by the changes she saw as non-traditional ToFs became more visible in business schools, if not in economics departments (E. T. Penrose, 2009: 235). However, while TTGF's connection to the resource-based view (RBV) in strategic management is generally how ETP is remembered today, we suggest that ETP's greatest contribution rests in the 'natural language' she developed to describe entrepreneurial activity. Rather than an attempt to model optimal economic behavior, TTGF harkens back to the work of Marshall, FHK, and Coase, providing insight into how entrepreneurs engage with an uncertain world in the pursuit of economic value. In line with FHK, ETP showed all entrepreneurial choices in a non-blackboard world are 'under uncertainty' and thus ethically burdened, impacting others' lives. Consequently, in line with Marshall, FHK, and Coase, ETP's economics was of a more open society, with better production and distribution of economic goods, and more personal freedom (E.T. Penrose, 1958, 2009: 235).

The Separation

Having connected ETP to an 'invisible college' including Marshall, FHK, and Coase, we examine her separation of services from resources, a core aspect of the MKCP project's

heterodoxy. Mainstream economists equate them, meaning economic activity is about moving fixed resources around, sometimes combining them. Distinguishing the resources from the services they provide the firm creates a logical space for economic growth. The human imagination can act to increase value without any market (pricing) interaction. ETP was remarkably silent on where she got this idea. To pass over this, or to presume that she thought of it for herself does her no favors, insulting her intense study and scholarship.

The subtlest aspects of TTGF lie in the issues ETP dismissed, ignored, or obscured. She was remarkably up front about some. First, her focus on internal (endogenous) growth alone (E. T. Penrose 2009: 5). Second, her narrowed institutional context (E. T. Penrose 2009: 5). Third, her inattention to principal-agent issues around managerial incentives (E. T. Penrose 2009: 236). Finally, the most serious issue was around her “alleged ‘tautological problem’” (E. T. Penrose 2009: 6), her inattention to firms that did not grow yet seemed in no way different from those that did, except that they did not grow.

More serious still were the difficulties arising from the separation (E.T. Penrose, 2009: 25). Those of positivist disposition look in vain for a testable relationship between resources and services, grounded on something measurable. ETP offered no testable relationship between resource(s) and firm growth precisely because she separated them by resources and the services provided by under-determined imagining and learning, for there can be no measure of imagining. Likewise, she offered no measure of management’s capability to transform the resources available into novel services, nor of management’s capability to generate growth. She also did not offer any testable theory of managerial learning that would relate experience or time to capability or firm growth. Perhaps, as the RBV suggests, resources were simply those ‘things’ that ‘caused’ growth; in which event the tautology was vicious. Was anything useful left once the

tautology was exposed?

The radical nature of her focus on the services provided by the firm's resources rather than on resources as defined by prices separated her analysis from mainstream economics. No question, it spurred many to see TTGF as under-theorized (Kor *et al.*, 2016: 1738). Those trying to formalize TTGF had to claim finding therein some measurable variables such as the formulae in Buckley and Casson (2007) or the curves in Rubin (1973), Slater (1980), or Uzawa (1969). However, these variables were far from the MKCP vocabulary. ETP seemingly skirted tautology without recognizing it was the inevitable consequence of a positivist determinism that searches for testable theories in historical processes (Parsons, 1968; Popper, 2002).

Contrary to Buckley and Casson's (2007) claim that ETP's method was non-heterodox, our examination of ETP's methods suggest they were deeply institutional and anti-positivist. Her empirics were likewise historical and institutional, as evidenced in her Hercules study (see E. T. Penrose, 1960). Note her methods differed from Chandler's 'compare and contrast' study of the adoption of the M-form in his 50 US companies (Chandler, 1962). Chandler's intuition was that all firms in all industries needed to adapt their structures as their strategies evolved, especially to cope with diseconomies of scale. In contrast, ETP was not searching for causal relations or the predictability Friedman argued was the essence of 'scientific' theorizing. Rather, like others involved in the MKCP project, she aspired to help entrepreneurs by revealing socio-economic tendencies that would clarify the nature and limits of their agency. Illuminating these might help them create arrangements that better served both their firms' interests and society's.

Returning to the question of the origins of ETP's separation of resources and services, there is no definitive answer. She may not have known herself, nor cared much, but the separation identified the boundary between the language of the market and the language of the

firm, the place where resources might be transformed into services, and vice versa. Given the transformation was key to the firm as an apparatus of ‘endogenous growth’ there are questions around why, when so many believe ETP was the author of the first such theory, Paul Romer received the ‘Economics Nobel’ in 2018. Romer’s work seemed to overlook entrepreneurs and firms entirely (e.g., Romer, 1990). However, Romer’s methods were formal, which might explain why his work was honored. Note ETP’s work was not cited in his entire *oeuvre*.

One possible source of the separation was Pen’s work. A decade before meeting ETP he investigated how the Japanese people had increased their nation’s food supply far beyond what agricultural economists theorized possible. It seemed they had learned something these economists had not. Pen saw this learning as institutional, not a technological breakthrough. Japan’s religious, legal, technological, and agricultural institutions constituted a mode of life that fell outside the Western agricultural theorists’ ken, a ‘*weltanschauung*’ to which Western economists were not privy (E. F. Penrose, 1929, 1934). ETP’s firm was just such a novel worldview, occupied and bounded by its singular language (Spender, 2014).

Another speculation was that ETP found the separation in Marshall, where we hear everything about economics can be found. Raffaelli unpacked the ‘model of learning’ laid out in Marshall’s *Ye Machine* (Raffaelli, 2003: 28). At its core was an interplay of imagining and routinizing, a notion that re-appeared in Simon (1958) and Nelson and Winter (1982). However, TTGF offered no such theory of managerial or team learning. Thus, we suggest that the inspiration for the separation in TTGF came from elsewhere, perhaps from FHK’s work.

There was no indication ETP studied FHK’s work carefully. Indeed, Machlup’s disagreements with FHK may have dissuaded her. However, the 1933 *Preface to the Re-Issue of RUP* may have seemed especially relevant. In it FHK took issue with Pigou on ‘economies of

scale' and wrote the relationship between efficiency and size is "one of the most serious problems of theory" arguing "generally speaking the expansion of a firm ... cannot be represented by a reversible functional relation" (Knight, 2006: xiii, xxiii). He dismissed rigorous models and brought management knowledge and learning to the center (Knight, 2006: xxv), arguing "[t]he basic economic magnitude ... is service, not good" (Knight, 2006: xxvi). FHK looked at economics through the entrepreneur's lens rather than through the prism of the perfect market. Thus, obliquely, but in support of our assertion that the separation might have been inspired by FHK, we offer: "I am convinced that less damage has been done to economic thinking by any other single error, unless it be that of labor cost, than by the notion of production as production of wealth; production is the rendering of service, by goods (wealth) and by persons" (Knight, 2006: xxvi).

Concluding Comments

ETP did not move with the MKCP project as it grew into New Institutional Economics (NIE). NIE's most defining development was 'transaction costs' (TCs), generally attributed to Coase but already evident in FHK's work. Note Coase mentioned 'entrepreneur' over 20 times in his 1937 paper, TCs not once. TCs bear on the question of into which services should the firm's available resources be transformed and how, the study of which would have added additional axioms and depth to ETP's analysis. Largely derived from Williamson's work, the popular view is that firms exist when they lessen the TCs that would be incurred were the same transactions conducted in markets (Williamson, 2010). This view diverges far from the MKCP project. When TCs are non-zero but determinable, they can only be distinguished from factor costs arbitrarily and so can never 'explain' the choice of firm or market arrangements. The firm must exist before these costs can be incurred, known, and compared. In contrast, if TCs are not determinable but

are matters of entrepreneurial valuation, calling for judgment rather than computation, the analysis shifts from formalism into pluralism (Spender, 2018).

The MKCP project explored how pluralist thinking might aid the entrepreneurs' practical arts, illuminating their experience of the 'ordinary business of life'. Non-zero TCs help clarify the conceptual distance between the RBV and ETP's thinking. Aside from Wernerfelt's (1984: 171) serendipitous borrowing of ETP's notion of the firm as a 'broader set of resources', there is little echo of ETP's thinking in the RBV literature (Kraaijenbrink, Spender, & Groen, 2010; Rugman & Verbeke, 2002, 2004). There is no firm in the RBV, nor mechanisms to transform resources into services or profits. There is also no analysis beyond the tautology that valuable, rare, inimitable, and non-substitutable (VRIN) resources earn sustainable rents (Conner, 1991; Conner & Prahalad, 1996; Priem, 2001; Priem & Butler, 2001). Ironically, the RBV's tautology is even more vicious than ETP's since time, evolution, learning, and history, and all questions about the acquisition, integration, deployment, and transformation of VRIN resources, are excised (Barney, 1991; Barney & Mackey, 2005).

Non-zero TCs bear directly on ETP's methods. Yet there was no sign her fondness for Marshall led her to read J. N. Keynes' *The Scope and Method of Political Economy*. Her comments on research method in TTGF and in her 1958 Baghdad paper present rigorous and interpretive methods as alternatives (E. T. Penrose, 1958). Most social scientists agree, debating whether the methods can complement each other for fuller understanding or are categorically distinct implying incompatible research projects. However, in the real world TCs are never zero and the debate is different. Costs are as many-dimensional as our knowledge of the world, calling for entrepreneurial judgment about their type and dimension.

Keynes's three dimensioned analysis of (a) formal theory, (b) political-economic

research, and (c) agentic art limited the relevance of formal theorizing in precisely the way the members of the MKCP project argued. In the end, institutional analysis is never determinative. Executive art is always required whenever TCs are positive. Such entrepreneurial capabilities are ‘costly’, but not as factors of production and the monetary terms of much of the current NIE literature. They may instead be matters of emotional, psychological, or ethical burden, or matters of non-zero time (Spender, 2018).

While Coase’s suggestions about entrepreneurship in “Nature of the Firm” were astringent and ambiguous, putting deals together is always a matter of entrepreneurial judgment, never simply a matter of computing measurable costs (Coase, 1937: 390). FHK’s and Coase’s focus on alternative social organizations considered these arrangements’ TCs pluralistically. Unfortunately, there is no sign that ETP never studied FHK’s or Coase’s work closely enough to ponder the impact of positive TCs on her thinking. But given her fieldwork and deep familiarity with the executive process she would surely have found it profitable.

In closing, ETP brought a deep political and ethical awareness to her economics. She was a labor activist in her youth, travelled widely, and saw revolution up front in Iraq (A. Penrose, 2018). ETP knew economics could only be ‘useful’ if it was politically and ethically situated and informed, a long way from the mainstream’s blackboard. Her other intuitions were apposite, for she realized all business thinking would be ‘global’ long before international business became established in business schools (Dunning, 2003). Finally, despite being acclaimed as firm growth’s premier theorist she could not have anticipated the turn away from her ethically grounded discussion of growth in today’s environment where unicorns and GAFA firms are lauded as pinnacles of achievement. In such firms, growth is the end, rather than a process, which managers and entrepreneurs pursue.

REFERENCES

- Alchian, A.A. 1950. Uncertainty, evolution, and economic theory. *The Journal of Political Economy*, 58(3): 211-221.
- Alchian, A.A. 1953. Biological analogies in the theory of the firm: Comment. *American Economic Review*, 43(4): 600-603.
- Alchian, A.A. & Demsetz, H. 1972. Production, information costs, and economic organization. *American Economic Review*, 62(5): 777-795.
- Backhouse, R.E. 2004. *The Ordinary Business of Life: A History of Economics from the Ancient World to the Twenty-first Century*. Princeton: Princeton University Press.
- Backhouse, R.E. & Fontaine, P. (Eds.). 2010. *The History of the Social Sciences Since 1945*. Cambridge: Cambridge University Press.
- Barglela-Chiappini, F. (Ed.). 2009. *The Handbook of Business Discourse*. Edinburgh: Edinburgh University Press.
- Barnard, C. I. 1938. *The Functions of the Executive*. Cambridge MA: Harvard University Press.
- Barney, J. B. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17(1): 99-120.
- Barney, J.B. & Mackey, T.B. 2005. Testing resource-based theory. In *Research Methodology in Strategy and Management*, Vol. 2 D.J. Ketchen & D.D. Bergh (Eds.) Greenwich, CT: Elsevier; 1-13.
- Berle Jr, A.A. & Means, G.C. 1932. *The Modern Corporation and Private Property*. New York: Macmillan.
- Best, M.H. 2012. The obscure firm in the *Wealth of Nations*. In *Handbook on the Economics and Theory of the Firm*, M. Dietrich & J. Krafft (Eds.) Cheltenham, UK: Edward Elgar; 29-41.
- Blundel, R.K. 2015. Beyond strategy: A critical review of Penrose's 'single argument' and its implications for economic developmeny. *European Journal of the History of Economic Thought*, 22(1): 97-122.
- Boyd, R. 1997. Introduction to the transaction edition. In *The Ethics of Competition*, R. Boyd (Ed.) New Brunswick NJ: Transaction Publishers; vii-xxxii.
- Buckley, P.J., & Casson, M. 2007. Edith Penrose's theory of the growth of the firm and the strategic management of multinational enterprises. *Management International Review*, 47(2), 151-173.
- Chandler, A.D. 1962. *Strategy and Structure: Chapters in the History of the American Industrial Enterprise*. Cambridge MA: MIT Press.

- Coase, R.H. 1937. The nature of the firm. *Economica*, 4(16): 386-405.
- Coase, R.H. 1964. The regulated industries: Discussion. *American Economic Review*, 54(3): 194-197.
- Coase, R.H. 1998. The new institutional economics. *American Economic Review*, 88(2): 72-74.
- Connell, C.M. 2007. Discerning a mentor's role: The influence of Fritz Machlup on Edith Penrose and *The Theory of the Growth of the Firm*. *Journal of Management History*, 13(3), 228-239.
- Connell, C.M. 2009. Method, structure and argument in Edith Penrose's theory of growth. *Review of Political Economy*, 21(4): 549-566.
- Conner, K.R. 1991. A historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm? *Journal of Management*, 17(1): 121-154.
- Conner, K.R. & Prahalad, C.K. 1996. A resource-based theory of the firm: Knowledge versus opportunism. *Organization Science*, 7(5): 477-501.
- Cooren, F., Kuhn, T.R., Cornelissen, J.P., & Clark, T. 2011. Communication, organizing and organization: An overview and introduction to the special issue. *Organization Studies*, 32(9): 1149-1170.
- Demsetz, H. 1988. The theory of the firm revisited. *Journal of Law, Economics, and Organization*, 4(1, Spring): 141-161.
- Denhardt, E. 1943. *Food control in Great Britain*. Montreal: International Labour Office.
- Dunning, J.H. 2003. The contribution of Edith Penrose to international business scholarship. *Management International Review*, 43(1): 3-19.
- Emmett, R.B. 2009. Frank Knight: Economics versus religion. In *Frank Knight and the Chicago School in American Economics*, R. B. Emmett (Ed.) Abingdon: Routledge; 159-170.
- Emmett, R.B. 2010. The economic organization, by Frank H. Knight: A reader's guide. In *The Elgar Companion to the Chicago School of Economics*, R. B. Emmett (Ed.) Cheltenham: Edward Elgar; 52-58.
- Foss, N.J. 1991. The suppression of evolutionary approaches in economics: The case of Marshall and monopolistic competition. *Methodus*, 3: 65-72.
- Foss, N.J. 1994. The biological analogy and the theory of the firm: Marshall and monopolistic competition. *Journal of Economic Issues*, 28(4): 1115-1136.
- Foss, N.J. 1998. The theory of the firm: An introduction to themes and contributions. Working Paper, DRUID Copenhagen Business School.

- Foss, N.J. 1999. Edith Penrose, economics and strategic management. *Contributions to Political Economy*, 18(1): 87-104.
- Foss, N.J., Lando, H., & Thomsen, S. 2000. The theory of the firm. In *Encyclopedia of Law and Economics*. B. Bouckaert & G. De Geest (Eds.) Cheltenham: Edward Elgar; 631-658.
- Foss, N.J. & Klein, P.G. 2006. The emergence of the modern theory of the firm. Working Paper, SSRN #982094.
- Friedman, M. 1953. The methodology of positive economics, In *Essays in Positive Economics*, M. Friedman (Ed.) Chicago, IL: University of Chicago Press; 3-43.
- Greif, A. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. New York: Cambridge University Press.
- Hardy, C., Lawrence, T.B., & Grant, D. 2005. Discourse and collaboration: The role of conversations and collective identity. *Academy of Management Review*, 30(1): 58–77.
- Heller, W.W. 1951. The anatomy of business decisions. *Harvard Business Review*, 29(2): 95-103.
- Keynes, J.N. 1890. *The Scope and Method of Political Economy*. London: Macmillan.
- Knight, F.H. 1924. The limitations of scientific method in economics. In *The Trend of Economics*, R. G. Tugwell (Ed.) New York: F. S. Crofts and Company; 229-267.
- Knight, F.H. 2006. *Risk, Uncertainty and Profit*. Mineola NY: Dover Publications.
- Knight, F.H. 2013. *The Economic Organization* (With a New Introduction by Ross B. Emmett ed.). New Brunswick NJ: Transaction Publishers.
- Kor, Y.Y. & Mahoney, J.T. 2000. Penrose's resource-based approach: the process and product of research creativity. *Journal of Management Studies*, 37(1): 109-139.
- Kor, Y.Y. & Mahoney, J.T. 2004. Edith Penrose's (1959) contributions to the resource-based view of strategic management. *Journal of Management Studies*, 41(1): 183-191.
- Kor, Y.Y., Mahoney, J.T., & Michael, S.C. 2007. Resources, capabilities and entrepreneurial perceptions. *Journal of Management Studies*, 44(7): 1187-1212.
- Kor, Y.Y., Mahoney, J.T., Siemsen, E., & Tan, D. 2016. Penrose's *The Theory of the Growth of the Firm*: An exemplar of engaged scholarship. *Production and Operations Management*, 25(10): 1727-1744.
- Kraaijenbrink, J., Spender, J.-C., & Groen, A. 2010. The resource-based view: A review and assessment of its critiques. *Journal of Management*, 36(1): 349-372.
- Lazonick, W. 2002. The US industrial corporation and *The Theory of the Growth of the Firm*. In *The Growth of the Firm: The Legacy of Edith Penrose*, C. N. Pitelis (Ed.) Oxford: Oxford

University Press; 249-277.

Lazonick, W. 2020. Is the most unproductive firm the foundation of the most efficient economy? Penrosian learning confronts the neoclassical fallacy. Working Paper No. 111, Institute for New Economic Thinking.

Loasby, B.J. 1999. The significance of Penrose's theory for the development of economics. *Contributions to Political Economy*, 18(1): 31-45.

Loasby, B.J. 2012. Edith Penrose and George Richardson. In *Handbook on the Economics and Theory of the Firm*, M. Dietrich & J. Krafft (Eds.) Cheltenham, UK: Edward Elgar; 227-249.

Machlup, F. 1954. Monopoly and the problem of economic stability. In *Monopoly and Competition and their Regulation*, E.H. Chamberlin (Ed). London: Palgrave Macmillan; 385-397.

Machlup, F. 1958. *An Economic Review of the Patent System*. Study No. 15 of the Subcommittee on Patents, Trademarks and Copyrights of the Senate Committee on the Judiciary. Washington DC: US Government Printing Office.

Machlup, F. 1962. *The Production and Distribution of Knowledge in the United States*. Princeton NJ: Princeton University Press.

Machlup, F. 1967. Theories of the firm: Marginalist, behavioral, managerial. *American Economic Review*, 57(1): 1-33.

Machlup, F. & Penrose, E. T. 1950. The patent controversy in the nineteenth century. *Journal of Economic History*, 10(1): 1-29.

Marshall, A. 1964. *Elements of Economics of Industry*. London: Macmillan.

Marshall, A. 1969. *The Principles of Economics*. London: Macmillan.

Medema, S.G. 1995. Ronald Coase on economics and economic method. *History of Economics Review*, 24(1): 1-22.

Mirowski, P. & Nik-Khah, E. 2017. *The Knowledge We Have Lost in Information: The History of Information in Modern Economics*. Oxford: Oxford University Press.

Moore, G.C.G. (2003). John Neville Keynes's solution to the English Methodenstreit. *Journal of the History of Economic Thought*, 25(1), 5-38.

Nelson, R.R. & Winter, S.G. 1982. *An Evolutionary Theory of Economic Change*. Cambridge MA: Belknap Press.

Ogilvie, S.C. 2011. *Institutions and European Trade: Merchant Guilds, 1000 - 1800*. Cambridge: Cambridge University Press.

Parkin, M. & King D. 1992. *Economics*. Wokingham: Addison Wesley.

- Parsons, T. 1968. *The Structure of Social Action: A Study in Social Theory with Special Reference to a Group of Recent European Writers*. New York: The Free Press.
- Penrose, A. 2018. *No Ordinary Woman: The Life of Edith Penrose*. Oxford: Oxford University Press.
- Penrose, E.F. 1929. *Agricultural and Mineral Production in Japan*. Honolulu, HI: Institute of Pacific relations.
- Penrose, E.F. 1934. *Population Theories and Their Application; with Special Reference to Japan*. Stanford University: Food Research Institute.
- Penrose, E.T. 1951. *The Economics of the International Patent System*. Westport, CT: Greenwood Press.
- Penrose, E.T. 1952. Biological analogies in the theory of the firm. *American Economic Review*, 42(5): 804-819.
- Penrose, E.T. 1953. Rejoinder. *American Economic Review*, 43(4): 603-609.
- Penrose, E.T. 1955. Limits to the growth and size of firms. *American Economic Review*, 45(2): 531-543.
- Penrose, E.T. 1958. Role of economic analysis in political decisions. *Bulletin of the College of Arts and Sciences, Baghdad*, 3(June).
- Penrose, E.T. 1960. The growth of the firm - a case study: The Hercules Powder Company. *Business History Review*, 34(1): 1-23.
- Penrose, E.T. 2009. *The Theory of the Growth of the Firm* (4th ed.). Oxford: Oxford University Press.
- Penrose, P. & Pitelis, C.N. 1999. Edith Elura Tilton Penrose: Life, contribution and influence. *Contributions to Political Economy*, 18(1): 3-22.
- Pigou, A.C. 1928. An analysis of supply. *The Economic Journal*, 38(150): 238-257.
- Pitelis, C.N. 2000. A theory of the (growth of the) transnational firm: a Penrosean perspective. *Contributions to Political Economy*, 19(1): 71-89.
- Popper, K.R. 2002. *The Poverty of Historicism*. London: Routledge.
- Priem, R.L. 2001. Tautology in the resource-based view and the implications of externally determined resource value: Further comments. *Academy of Management Review*, 26(1): 57.
- Priem, R.L. & Butler, J.E. 2001. Is the resource-based 'view' a useful perspective for strategic management research? *Academy of Management Review*, 26(1): 22.
- Raffaelli, T. 2003. *Marshall's Evolutionary Economics*. London: Routledge.

- Raffaelli, T., Becattini, G., & Dardi, M. 2006. *The Elgar Companion to Alfred Marshall*. Cheltenham, UK: Edward Elgar.
- Robbins, L. 1928. The Representative Firm. *The Economic Journal*, 38(151), 387-404.
- Romer, P.M. 1990. Endogenous technological change. *Journal of Political Economy*, 98(5, Part 2): S71-S102.
- Rubin P.H. 1973. The expansion of firms. *Journal of Political Economy*, 81(4): 936-949.
- Rugman, A.M. & Verbeke, A. 2002. Edith Penrose's contribution to the resource-based view of strategic management. *Strategic Management Journal*, 23(8): 769-780.
- Rugman, A.M. & Verbeke, A. 2004. A final word on Edith Penrose. *Journal of Management Studies*, 41(1): 205-217.
- Simon, H.A. 1958. *Administrative Behavior* (2nd ed.). New York: Macmillan.
- Simons, H.W. 1990. *The Rhetorical Turn: Invention and Persuasion in the Conduct of Inquiry*. Chicago IL: University of Chicago Press.
- Slater, M. 1980. The managerial limitations in the growth of firms. *The Economics Journal*, 90(359): 520-528.
- Spender, J.-C. 2014. *Business Strategy: Managing Uncertainty, Opportunity, and Enterprise*. Oxford: Oxford University Press.
- Spender, J.-C. 2018. Managing - according to Williamson, or to Coase? *Kindai Management Review*, 6: 13-34.
- Uzawa, H. 1969. Time preference and the Penrose effect in a two-class model of economic growth. *Journal of Political Economy*, 77(4): 628-652.
- Van Horn, R., Mirowski, P., & Stapleford, T.A. (Eds.). (2011). *Building Chicago Economics: New Perspectives on the History of America's Most Powerful Economics Program*. Cambridge: Cambridge University Press.
- Veblen, T. 1898. Why is economics not an evolutionary science? *Quarterly Journal of Economics*, 12(4): 373-397.
- Wernerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal*, 5(2): 171-180.
- Whitaker, J. 1975. *The Early Economic Writings of Alfred Marshall, 1867-90*. London: Macmillan.
- Williamson, O.E. 1986. *Economic Organization: Firms, Markets and Policy Control*. Brighton, Sussex: Wheatsheaf Books.

Williamson, O.E. 2010. Transaction cost economics: An overview. In *Elgar Companion to Transaction Cost Economics*, P.G. Klein & M.E. Sykuta (Eds.) Cheltenham: Edward Elgar; 8-26.

Young, A.A. 1925. The trend of economics, as seen by some American economists. *Quarterly Journal of Economics*, 39(2): 155-183.