

Edith T. Penrose and Frank H. Knight, economists of 'the ordinary business of life'

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Abbreviations:

LGSF - *Limits to the Growth and Size of Firms* (E. T. Penrose, 1955)

RUP - *Risk, Uncertainty, and Profit* (Knight, 2006)

TTGF - *The Theory of the Growth of the Firm*, 4th Edition (E. T. Penrose, 2009)

ToF - Theory of the Firm

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1. Introduction

This essay explores affinities and metaphors shared in the works of Frank Knight (1885-1972) and Edith Penrose (1914-1996). Our claim is (a) that Edith Penrose (ETP) shared much of Frank Knight (FKH)’s methods and sense of how ordinary economic processes worked, and (b) looking into this helps illuminate the nature and extent of her achievement and how it might play out in the future. There are difficulties, of course, given both authors’ work was original and dense, and exploring connections was complicated by ETP not commenting directly on any of FKH’s ideas, no matter how closely allied. Evidence of sharing, such as citations, was sparse. RUP was cited just twice without comment in footnotes to TTGF (E. T. Penrose, 2009:50,69). There was nothing further on FKH’s ideas in her *oeuvre*. Nor was FKH’s work much mentioned in the many contemporary commentaries on ETP’s work (e.g. Foss, 1999; Lazonick, 2002; Loasby, 1999b, 2002, 2012; A. Penrose, 2018; Pitelis, 2002b). Equally, ETP was not mentioned in Ross Emmett’s authoritative analyses of FKH’s life and works (Emmett, 2009a).

¹ Alfred Marshall’s definition of economics was the “study of mankind in the ordinary business of life” (Marshall 1969:1, quoted in Penrose 2009:234)

But the claim seems viable, nonetheless. Both authors were committed anti-positivists working to bring the entrepreneurial imagination into microeconomics, partners in a small bubble of people who paid attention to each other's publishing and often knew each other personally (Fiorito, 2016; Hammond, 1991). Knight's lever was the entrepreneur's judgment in the face of the ordinary business of life's 'uncertainties', Penrose focused on the management team's 'learning' from dealing with uncertainties. Both pursued entrepreneurial 'theories of the firm', though neither's work is much evident in today's entrepreneurship canon (e.g. Acs & Audretsch, 2010; Casson, 2005). Both saw theorizing the entrepreneur's imagination as key to better understanding microeconomics and 'the nature of the firm'. In this they stood against mainstream economics, even as many assume FHK was its architect, the founder of the Chicago School and George Stigler's and Milton Friedman's teacher (Backhouse, 2004:203; Emmett, 2009a; Van Horn, Mirowski, & Stapleford, 2011). Both entertained the possibility of rigorous economic theory, 'objective' and 'scientific' in the sense of being independent of the individuals engaged (Knight, 1924; E. T. Penrose, 1958). Our essay's aim is to clarify these intuitions and connections. We reach back to the work of Alfred Marshall and suggest FHK channeled some of Marshall's ideas towards ETP. Her intellectual sources remain under-researched, though Brian Loasby has long pointed to Marshall's influence (Loasby, 1976; 1999a:24; Volpe & Biferali, 2008). Felipe Almeida and Huáscar Pessali explored links with Veblen (Almeida & Pessali, 2017). ETP's path-breaking paper on biological theories of the firm took off from Marshall, and she mentioned both Marshall and Ronald Coase in her retrospective *Foreword to TTGF's 3rd edition* (E. T. Penrose, 1952; 2009:234).

Our discussion revolves around the methodological issues that concerned them both (Knight, 2006:5n2; E. T. Penrose, 1958). These days the main goal of academic activity is systematic theorizing in the 'positivist science' model; entities and variables are objectively defined, their inter-relationships hypothesized and tested empirically. But entrepreneurship theory's entities, variables, and relationships are not so clear. Even the boundaries of 'entrepreneurship research' are debated. In their comprehensive *Handbook of Entrepreneurial Research* Zoltan Acs & David Audretsch noted the Academy of Management's view of entrepreneurship's domain was 'the creation and management of new businesses as well as studying the characteristics and special problems of entrepreneurs' while the Strategic Management Society was more focused on 'competitive advantage and the individual-opportunity nexus' (Acs & Audretsch, 2010:4). But none of these terms were well-defined. In the absence of rigorous definitions, formal mathematical language, and testable theories, the discussion of entrepreneurship relies on a looser non-scientific

vocabulary and on natural language.

Our argument is that ETP drew materially on FHK's intuitions and language just as FHK drew on Marshall and others. Like all languages, academic languages stand on axioms, assumed distinctions that establish what terms mean and what they do not (Luhmann, 2002). The debate about whether names are arbitrary or reflect the reality of the things named goes back to Plato's *Cratylus* and remains unresolved. Thus, theorists proceed by selecting assumptions, assembling names and distinctions, and positing relations. Underlying RUP's language was Knight's underpinning intuition that given uncertainty, the economic system does not work only to satisfy human needs, it also shapes them (Kern, 1997; Knight, 1923:585; 2006:Ch 1). Thus, FHK separated what he meant by 'the economic system' from what mainstream price theory presumed, rejecting their idea that entrepreneurs meet demand in existing markets, but do not create it. Thereby FHK avoided axiomatizing the classical economists' 'market equilibrium', shifting focus onto ongoing interactions between uncertain individuals. His economics was not merely about personal 'choice', rational or otherwise. It axiomatized the interplay of free individuals and their social situation that is fundamental to institutional thinking. Absent an established a-historical and time-less theory of 'perfect' society, there can be no possibility of a rigorous economics of ordinary life. In this FHK was much influenced by two formative institutionalists, Allyn Young, his thesis supervisor and mentor, and Max Weber; indeed, FHK produced the first translation of Weber's *General Economic History* (Weber, 1961; Young, 1925). In complementary fashion ETP sought to understand a firm's growth within its national and political context (Blundel, 2015; E. T. Penrose, 1958). Her first publications on food supply in the UK and agriculture in Africa, published before she began her academic career, led to her theorize international business in the final chapters of TTGF and elsewhere (E. T. Penrose, 1942, 1948, 1958).

There are many axioms to economists' language. The most fundamental may be Adam Smith's 'division of labor' and exchange. There are also capital, land and labor. Then resources, property, title, opportunity costs, and so on. There is also co-ordination and administration. Plus, some economists develop axioms about 'knowledge', what we can know and compute. These are necessarily reflexive and subtly complicated; what is the knowledge status of a claim to know about knowledge? Ultimately our various academic research methods stand on what is presumed known or knowable, and whether such knowing is 'bounded' or admits other notions such as 'uncertainty' and 'unobservables', the 'unknown-unknowns' of Donald Rumsfeld that lie outside the known.

Academic activity is 'disciplined knowing' within the chosen method's assumptions. In the absence of a 'correspondence theory' of knowledge, the assumption that we see and know reality 'as it is', and that reality is all we can know, our knowledge claims are necessarily interpretive or subjective, though sometimes evaluated pragmatically by their usefulness as we exert our will on the world and cope with its slings and arrows.

The academics' 'stock-in-trade' is not knowing more, it is knowing with more discipline. One view of the academics' process is to distill generalizations from evidence framed as 'facts' by the axioms selected, so moving towards erasing the empirical situation's factual specifics. Disciplines evolve as assumptions and methods become accepted. Positivists, for example, presume reality, observability, and knowability are co-extensive, that 'scientific truths' are possible that capture reality's essence. This leaves little room for additional axioms about the human imagination as a force in social or economic affairs unless that too can also be analyzed and 'explained scientifically', a contradiction in terms. The imagination is sometimes labelled as 'the cause without a cause', a boundary to our reasoning but not to our knowing. Both FHK and ETP argued for boundaries to scientific knowing that would admit imagination (Knight, 1924; E. T. Penrose, 2009). The challenge of entrepreneurship theorizing, and with discussing FHK's and ETP's contributions, is that there is plenty of language but little of it disciplined or accepted as axiomatic.

The language of entrepreneurship draws from authors such as Richard Cantillon, JB Say, Adam Smith, Friedrich von Hayek, Joseph Schumpeter, Ludwig Lachmann, Israel Kirzner, GLS Shackle, and many current contributors. Two chapters in Acs & Audretsch by Sharon Alvarez et al and Saras Sarasvathy et al, drawing especially on an article by James Buchanan (another of FHK's students) and Viktor Vanberg, provided a good summary (Alvarez, Barney, & Young, 2010; Buchanan & Vanberg, 1991; Sarasvathy, Dew, Velamuri, & Venkataraman, 2010). Crucially, these authors adopted the method of 'contrast and compare'. This is rhetorical, non-positivist, and makes no claims to know reality 'objectively'. Rather it tests the power of the language-in-use. For example, one of the most famous syllogisms relates 'all men are mortal', 'Socrates is a man', therefore 'Socrates is mortal'. The language draws on accepted meanings and seems robust enough to sustain and clarify the conclusion as logical, even without reality claims.

Sarasvathy et al offered three contrasting and mutually informing views of 'the market' rather than a single defining one (Sarasvathy et al., 2010:79). Their analysis reflected the triad of axioms

about uncertainty they found in RUP; (a) discovering the future, (b) estimating the future when relevant facts are not discoverable, and (c) the residual irresolvable uncertainties the entrepreneur may bear with profit (Sarasvathy et al., 2010:80). They worked up a triad of complementary views of entrepreneurial opportunity; allocative, discovery, and creative. They adopted 'realism', associating it with a 'constructionist' method (Sarasvathy et al., 2010:28). Their language went far beyond framing entrepreneurship naïvely as 'coming up with great ideas' or being able to 'pick winners'. Instead, it embraced the more realistic processes of gathering inputs, shaping production, and effecting distribution. They proposed a vocabulary that engaged the ordinary business of life in a real socio-economy.

But the language generated was not able to grasp the full extent of FHK's or ETP's intuitions. Buchanan & Vanberg's article explored 'the evolution of non-equilibrium' and Prigogine's *leitmotiv* that 'the future is not given', rather that it is 'under-determined' and must be created (Prigogine, 1986:493). They labeled this method 'radical subjectivism' (Buchanan & Vanberg, 1991:171). Their article considered whether Lachmann's and Kirzner's analyses 'escaped teleology' and truly theorized non-equilibrium. They concluded not. Un-cited but inevitably in the background was Buchanan's 1963 Presidential address to the Southern Economic Association *What Should Economists Do?* which drew more directly on Marshall and FHK and explicitly related the development of a 'discipline' with that of 'language' (Buchanan, 1964:222). Marshall dealt at length with the limits to positivist science as a basis to economics, searching for a complementary evolutionary approach (Raffaelli, 2003). He proposed pluralism in economics, and both FHK and ETP followed (Earl & Wakeley, 2005; Kor & Mahoney, 2000; Levallois, 2011; Spender, 1998). Pluralist methods are indeterminate, they create 'spaces' between the incompatible languages in which the entrepreneurial imagination can act and create new value (Colander & Landreth, 2008; Dow, 2016).

Marshall worked in the shadow of the *Methodenstreit*, the destructive 'battle of method' in German economics precipitated between the economic historian Gustave von Schmoller and the formalist Carl Menger, also considered the founder of 'Austrian' economics. Marshall encouraged John Neville Keynes to show how eclecticism and pluralism could be a useful path past such methodological conflict by writing *The Scope and Method of Political Economy* (Keynes, 2011). Keynes's book became the leading British methodological text for economists. It argued 'useful' economics comprised three complementary bodies of knowledge: (a) rigorous theorizing, (b) study

of the context's political economy and history, and (c) attention to the arts of economic practice - in short, mathematics, history, and art. Both history and art lie beyond the grasp of scientific language. Note Milton Friedman's famous *Methodology of Positive Economics* took off from Keynes's book, dismissed both history and art, so narrowing Marshall's pluralism into today's neoliberal formalism (Friedman, 1953). Both FHK and ETP explicitly resisted such narrowing; indeed, ETP argued her readers should see TTGF as a work of art rather than of rigorous analysis or economic science (J. Penrose, 2018:182).

This section suggested FHK's and ETP's methodological similarity. Both were pluralists, both theorized 'opportunity spaces' for the entrepreneurial imagination (Hands, 1997). Of course, they also differed in many respects, most obviously in how their respective non-equilibrium analyses might be bounded and so considered meaningful rather than merely tautological or meaningless. FHK spent the major part of his career as a 'social philosopher of freedom', seeing ethics as the ultimate bounds to his analysis. He argued 'every economic choice was ultimately a matter of ethics' (Boyd, 1997; Knight, 1922). ETP moved in a different direction and argued economics was ultimately most useful as the handmaiden to the nation's politics, which bounded its relevance (E. T. Penrose, 1958). Both regarded economics' purpose was to improve the human condition by providing better insight into how the economic aspects of ordinary life worked.

2. Penrose and the Theory of the Firm in 1947

This essay is about FHK as one of ETP's principal intellectual sources. Though there is little note of FHK's work in her writings, there was a scholarly link through Fritz Machlup, her MA and PhD theses supervisor at Johns Hopkins (Connell, 2007a, 2007b, 2009). Machlup was an 'Austrian' economist who knew FHK personally and professionally. Machlup's economic methodology textbook included his battles decades earlier with Knight over 'capital' (Machlup, 1978:215). ETP presumably attended Machlup's lectures, with their various other comments on FHK, when she arrived at Johns Hopkins in 1947 and came under his tutelage.

Many reading TTGF today, especially if they presume it was ETP's PhD thesis under Machlup, may equally presume she knew little about economics or economists before she began her studies in 1947. This is wrong. In 1936 ETP, a California native, was doing undergraduate economics at UC

Berkeley. Among her instructors was Ernest Francis Penrose, a leading agricultural and development economist (E. F. Penrose, 1934; Schumpeter, 2000). ETP became Professor Penrose's research assistant. On graduation she married a fellow student lawyer, David Denhardt, and the couple headed to Northern California to begin young family life. In 1938 her husband was killed in what was probably a political hit. Professor Penrose (Pen) offered help and suggested ETP 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 and, once there, became deeply involved in international economic policy matters at the highest level. By 1946 she had married Pen and returned to the US with their two new children. In New York she worked closely with Eleanor Roosevelt on the *Universal Declaration of Human Rights*. In 1947 Pen secured a post at Johns Hopkins. Perhaps the prospect of being a faculty wife provoked ETP to begin her own 'formal' academic career with an MA (A. Penrose, 2018:110). But she was no novice. She was a widely experienced economic researcher who also knew personally many of the world's leading economic policymakers and English-language economists, including Friedrich von Hayek, Lionel Robbins, Austin Robinson, and the Schumpeters (A. Penrose, 2018:65).

Given ETP's legendary discipline, work ethic, activist background, and international experience, it was surprising she had no specific 'research question' in mind for her studies (A. Penrose, 2018:111). Lacking this, she joined the newly arrived Machlup on his project to research the economic impact of patents (Machlup, 1958, 1962). Her 1948 MA paper was *Discussion of Patents in Economic Doctrine*. Machlup was highly impressed. They collaborated further on *The Patent Controversy in the 19th Century* (Machlup & Penrose, 1950). This examined the economic consequences of the patent system, an institution typically defended by mainstream economists of strong property-rights. Pen's knowledge of international economics, history, and institutions helped ETP extend the work into a PhD, published as *The Economics of the International Patent System* (E. T. Penrose, 1951). It attracted positive professional attention. Pitelis suggested this also affirmed ETP's early interest in monopoly, innovation, and social welfare (Pitelis, 2002b). Machlup foot-noted ETP in his paper to the 1951 *Round Table Conference on Monopoly, Competition, and their Regulation*, noting her 'valuable contributions' (Machlup, 1954:387). The conference attendees included Joe Bain, Edward Chamberlin, J M Clark, FHK, Arthur Lewis, and the Robinsons. With a growing family and poor salary, it is unlikely ETP attended (A. Penrose, 2018:118).

In 1951 ETP was appointed a Johns Hopkins Research Associate and Lecturer in Political

Economy, lecturing on social control of industry, monetary economics, and international economics. Looking for additional income, she joined the new research project on the growth of firms being managed by G. H. Evans and Machlup. It was well funded by the *Merrill Foundation for the Advancement of Financial Knowledge* (A. Penrose, 2018:175; E. T. Penrose, 1952:1n; 2009:xlviii). Knowing little about how economists treated 'the firm' she settled into nine months of reading and thinking, concluding that little in the traditional theory of the firm literature was relevant to theorizing firm growth (J. Penrose, 2018:176; P. Penrose & Pitelis, 2002:19).

Somewhat to her own astonishment, after her years of analyzing and reporting others' empirical data and thinking, she began to 'theorize' her own 'theory of the firm' (ToF). The first signs appeared in her squabble in the pages of the *American Economic Review*. She took Armen Alchian to task over economists' use of biological models (Alchian, 1950, 1953; E. T. Penrose, 1952, 1953). She faulted him for excising human agency, though without offering a competing growth theory of her own and following, without citation, Allyn Young's argument (Young, 1925:157). Young, of course, was FHK's thesis adviser and helped him reshape his thesis into RUP (Knight, 2006:xi). ETP's analysis included detailed consideration of Marshall's evolutionary writings, and TS Ashton's and Kenneth Boulding's use of biological models (E. T. Penrose, 1952:805 notes; 2009:234). Bringing evolution, agency, and learning to the center of 'a theory of the growth of the firm' meant completely reconstructing the mainstream's equilibrium-based notions. Growth might then be driven endogenously by imagination and learning, as well as rationally by learning about and taking advantage of market imperfections and the firm's market power, however gained. *Inter alia*, ETP's interest in biological and evolutionary models led her to focus on 'process' as opposed to 'structure' or 'design', a distinction explored in today's sociological agency versus structure debates (e.g. Archer, 2003).

ETP's 1952 paper showed the first aspects of her emerging theory, that a firm's growth was (a) driven by its managers, and (b) limited by the skills and capacities of those managers (E. T. Penrose, 1952:808). Next, in LGSF, she elaborated her analysis (E. T. Penrose, 1955). LGSF contained most of the axioms evident later in TTGF. Central was her novel 'theoretical' distinction between 'economies of size' and 'economies of growth'. This rejected marginalist ToF languages based on scale or diseconomies, managerial or otherwise. It also played into her view that Anti-Trust policy was deeply flawed, based on inappropriate economic thinking. Lacking good economics, policy-makers fixated on the political downsides of monopoly power and denied themselves an

understanding of the possible benefits of bigness, especially when it came to funding and managing the research that led to innovation and field-shaping patents (Adams & Brock, 1986; E. T. Penrose, 2009:229). Her anti-Antitrust policy views were echoed, though from a different political viewpoint, as Oliver Williamson rethought monopoly policy during his time with the Antitrust Division in 1966 (Williamson, 1986:xv). Williamson's analysis had an impact on US policymakers that Penrose's did not; timing may be everything, but politics trumps all.

Working up LGSF helped ETP distill her research question (E. T. Penrose, 1955:531). In the *Foreword* to the 3rd Edition of TTGF, it was re-expressed 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). Growth was not driven by superior resources or comparative advantage; it was driven by managers' interests, attention, and skills. ETP's novel contrast between the economies of scale and 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. Marginalist language was simply irrelevant to the analysis of firm growth. Businesspeople generally pursue profit, as true in steady state as while growing, but generating growth was different. Rather than save the prevailing thinking, as Baumol, Boulding, Machlup, Marris, and others sought, ETP strove to theorize disequilibrium and learning. She declared managing growth was not the same phenomenon as managing steady state or seeking competitive equilibrium. The conventional literature erased the distinction. Likewise, growth by acquisition and growth by innovation were radically different, raising the new questions about monopoly thinking ETP sketched in the final chapters of TTGF (Blundel, 2015).

In 1954, funded by the *Foundation for Economic Education*, ETP spent six weeks with the managers of the Hercules Powder Company. Hercules had been spun off from Du Pont in a 1912 Antitrust decision. It had several lines of business, mostly in chemicals, explosives, and paints. Some grew, some did not. Hercules proved a perfect place for discussing ETP's ideas about the interplay of management interest, drive, and capability with the very managers involved. It went well, not surprisingly given her decades experience of dealing with senior public and private sector executives. At the time Hercules was effectively a conglomerate, engaged in radical innovation, diversification, and acquisition. ETP found her ideas very appropriate to illuminating what the firm was doing and intended to publish the resulting casework as part of TTGF. But it was excised by the Oxford UP editors against her wishes (E. T. Penrose, 1960, 1968).

What was the ToF literature that ETP read and dismissed when she began her research? Machlup summarized the field later in his Presidential address to the AEA in 1966 (Machlup, 1967). He recalled the disciplinary conflicts of the 1940s about whether marginalist theories of the firm should be displaced or merely supplemented by newer ideas, especially the ‘more realistic’ managerial and behavioral theories that had emerged since the 1920s. He likened the conflict to the *Methodenstreit* (Machlup, 1967:3). He concluded the field had fragmented into a plurality of incompatible theories, each with some merit. He sketched 10 and commended researchers to use the one best suited to their purpose. He did not cite TTGF or mention ETP.

Fortunately the history of ‘theorizing the firm’ has also been covered by other authors such as Boulding, Alex Coad, Nicolai Foss, Scott Moss, Denis O’Brien, and Paul Walker (Boulding, 1942; Coad, 2009; Foss, 2000; Moss, 1984; O’Brien, 1984; Walker, 2016). Again, the variety of notions was immediately obvious. ETP noted “The 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 economists think 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). But there was more to this than met the eye. Unlike her mainstream colleagues, she saw this as the beginning of an enquiry into firms and managing them, not the end. She thought every term they used, administration, organization, production, sale, goods, and resources, especially, begged questions. Absent physical definitions (i. e. an underpinning ontology), all were assumptions woven into a net of language intended to catch our experiences of firms. Better assumptions would open up the enquiry, leading to unfamiliar insights; bad assumptions would close it down, leading to poor thinking and poor policy fruit.

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 was basic. She presumed its coordination by managers using ‘authoritative communication’, a term taken from Chester Barnard (Barnard, 1938; E. T. Penrose, 2009:17n). Organization theorists took up this model, typically through the prism of Max Weber’s bureaucratic theory. Its history was then of increasing elaboration and sophistication, an evolving technology of direction and coordination which keeps our management education colleagues busy even as none of us seem sure how to address Ronald Coase’s 1937 questions about why firms exist in the first place (Coase, 1937). Firms were also seen

as 'organizations', along with other non-economic organizations such as churches, hospitals, and football leagues. Organization theorists developed an inventory of ToFs, as displayed, for instance, in Gareth Morgan's *Images of Organization* (Morgan, 1997). In addition to drawing on the OT classics ETP drew on Carnegie-Mellon OT ideas about managerial knowledge and behavior (E. T. Penrose, 2009:15n, 29n).

A rather different story is the modern ToF as a domain of the socially, ethically, and politically legitimated managerial power that emerged from the European guilds (Epstein & Prak, 2008; Greif, 2006; Ogilvie, 2011; Pfister, 2008). This modeled the firm as a community of power specific to its participants. Managers' power within their firm did not entail power over other communities. The firm was a private zone of fiat demarcated from the polity and socio-economy beyond its boundaries, where markets and other social arrangements pertained. Firms also emerged as traders sought legal ways to shield their assets and activities behind a 'legal veil'. There were remarkable developments in the US. In 1866 enterprising lawyers pushed the firm/society separation further, leveraging from the Constitution's 14th Amendment to establish the firm as a 'legal person'. The firm, already a 'legal fiction' with legal identity, acquired some of the independence and rights the Constitution grants US citizens (Lamoreaux, Raff, & Temin, 1997; Winkler, 2018). As the *Citizens United vs FEC* (2010) and *Hobby Lobby Stores* (2014) judgments have proven, US private firms' citizen-like rights have been extended significantly over the years (Guinnane, Harris, Lamoreaux, & Rosenthal, 2007).

Harold Demsetz summarized the mainstream economists' story on 'the firm' (Demsetz, 1988). From the time of Adam Smith until the 19th century economists' he saw that their principal focus was 'price theory', on markets' functioning. They argued well-functioning markets maximized society's economic benefits. This market-based agenda undercut consideration of firms as alternative 'problem solving institutions', alternative to markets. The mainstream analysis was of causes (prices) and consequences (trades). Firms then had no relevant features beyond their price-making or price-taking. Demsetz argued the work of FHK and Coase broke this analysis open by considering firms as alternative modes of social organization. Their chisel was 'uncertainty'. A new generation of economists investigated firms as uncertainty-bearing economic institutions, with non-market uncertainty-managing characteristics, moving microeconomics towards today's New Industrial Economics (NIE) theorizing (Brousseau & Glachant, 2008; Coase, 1998; Demsetz, 1988:141; Furubotn, 2001; Hodgson, 2003; Langlois, 1989, 2007; March & Olsen, 1984; Medema,

1997; Ménard & Shirley, 2008; North, 1986; Powell & Bromley, 2015; Powell & DiMaggio, 1991; Rutherford, 2009; Vromen, 1995; Williamson, 2000). Entrepreneurship was the resource able to bear uncertainty, ill-conceived as a price-able factor of production. Of course, disciplinary change is slow and complicated, and Demsetz's telling reflected his own theoretical agenda. He argued for no great difference between arrangements within firms and within markets, trashing the distinction as 'delusion' (Alchian & Demsetz, 1972:777). While Alchian and Demsetz theorized about 'teamwork', their arguments reinforced the mainstream economists' view that firms were creatures of market-defined characteristics only; other aspects were irrelevant. So, irrespective of their structure, leadership, or culture, firms that did not 'strategize' to profit-maximize would be selected out of existence.

Foss's story was more open and much more informative (Foss, 1991, 1994a, 1998; Foss & Klein, 2005, 2006; Foss, Lando, & Thomsen, 2000). Milton Friedman did not cause today's dominance of rigorous methods, as is so often charged. He merely memorialized and popularized what had already changed in microeconomics as a result of the mainstream's accelerated pursuit of formalism, beginning in the 1920s (Friedman, 1970). Foss saw it as an interesting example of path dependency within the economics community. Friedman's infamous *New York Times* article added little to Adolph Berle's 1932 *Harvard Law Review* paper (Berle Jr, 1932, 1965). Rather than beginning with Adam Smith and a free-market focus, Foss began with Thorstein Veblen's critique of mathematical economics (Foss, 1991:64; Veblen, 1898). Veblen was John Bates Clark's student. Clark developed a brutally competitive Darwinian view of economic activity. In contrast, Veblen explored the limits to such competition, especially the socially beneficial effects of well-built institutions. He became a 'Father of American Institutionalism'. He called for an evolutionary approach. Veblen's critique aligned with Alfred Marshall's, bearing in mind the 'folklore view' of Marshall as the Father of Marginalism was 'grossly inaccurate' (Foss, 1994a:1116; Raffaelli, 2003).

The history was that problems with naïve 'economies of scale' ToFs 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. This unproductive diversion ensured economists failed to embrace evolutionary ideas (Foss, 1994a:1117). But politics came into it too. There were urgent debates about firms as legitimated instances of entrepreneurs' evident freedoms to create monopolies, affecting the balance between citizenry, free competition, and government controls. In 1932 Adolf Berle and Gardiner Means drew attention to the separation of corporate ownership and

control and how that put managerial freedom at the center of a discussion about business's political power (Berle Jr & Means, 2003). As the socio-economy had evolved so firms had acquired two modes of existence, as economic citizen/actors and as private zones of managerial power. The second was bleeding into the first, providing managers with political powers about which they were not being held accountable.

One way to appreciate Foss's analysis was to track what happened to Marshall's 'representative firm' as it was criticized by Lionel Robbins (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, 1994a:1118; Marshall, 1969:263). The metaphor was carefully chosen to relate a number of evolving firms, each with their own character and in their own lifecycle, some prospering, some not, to their stable industry (Raffaelli, 2003:109). Whereas Marshall saw every real firm as unique, his representative firm was an 'ideal type' for analytic purposes. The representative firm is "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). It intermediated between (a) the heterogeneity of real firms, such as Marshall had observed during his 'wander-year', and (b) a real industry in equilibrium. It was central to Marshall's attempt to combine his idiographic and nomothetic intuitions into a formal system of practical economics. "It explains why Marshall's concept of industry equilibrium has no room for an equilibrium firm" (Foss, 1994a:1119). Pigou's 'equilibrium firm' eviscerated Marshall's varying firms, replacing them with a homogeneous 'black box' without internal characteristics, defined solely by market prices. As Boulding's survey made clear, the marginalist modifications introduced by Baumol and Marris left Pigovian universality in its place (Boulding, 1942, 1950).

The 'modern' ToF ETP encountered as she read into the ToF literature was this eviscerated model, generalized and devoid of particularity, what Coase would later dub 'blackboard economics' (Coase, 1964; Medema, 1995). All discussion of a firm's uniqueness was silenced. ETP knew the lifecycle ToF was analytically appealing because it gave every firm a unique non-market-defined character - its age. But she concluded the lifecycle ToF's merits came at too high a price for it erased the managers' 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). The firm's growth could only be understood as the consequence of specific decisions by specific managers. "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 variations of biological theory, viability and homeostasis.

In short, ETP's reading led her to dismiss her colleagues' nomothetic project, the pursuit of a rigorous and universal ToF. She chose instead to sketch firms idiographically, to capture their uniqueness, not as business historians do but with novel economic language of her own creation. It would stand on the managers' knowledge and entrepreneurial agency, most famously on their capability to transform resources into services. In lieu of historians' dates, the firm's time would be measured by their 'learning' how to do this. Few economists, Smith and Marshall being obvious exceptions, had the intellectual heft and disciplinary courage to attempt such argument, in part because they could then not avoid evaluating the contextualized ethical and policy implications of the specific managers' specific choices (E. T. Penrose, 1952:809). ETP's managers were making ethical choices.

While ETP was not aware of Al Chandler's work until after she completed TTGF she found it highly pertinent (Chandler, 1962; E. T. Penrose, 2009:234). They became friends even though his research methods and aims were very different (A. Penrose, 2018:272, plate 14). Both focused on the firm's managers rather than the firm's price-defined 'resources'. "While the enterprise may have a life of its own, its present health and future growth surely depend on the individuals who guide its activities." (Chandler, 1962:8). While ETP focused on the management team's learning, Chandler framed managerial agency in terms of novel entrepreneurial choices about the firm's market engagements and administrative structure. Their managers' learning was pushed into the background. Chandler inclined to the view that each firm discovered divisionalization for themselves rather than the view that they were absorbing a new technology of administration that had been invented at one firm and, unrestricted by patents or other frictions, had traveled across the US economy.

3. TTGF's Vocabulary

Section 2 considered why ETP did not take up the ToF vocabulary she had to hand in 1947. As Buckley & Casson summarized, she dismissed the idea that the size of firm was determined by the

interplay of the productive and managerial diseconomies of scale, arguing instead that it hinged on the dynamics of interacting 'economies of growth' (Buckley & Casson, 2007). This section details the vocabulary she developed to flesh out this intuition, especially about managers' drive, learning, and teamwork. To anticipate Section 4, both Marshall and FHK paid specific attention to their vocabulary and language (Knight, 1997). Both wrote on the attractions and limitations of mathematical language in economics (Knight, 1924, 1940; Raffaelli, 2003). Both were pluralists, using multiple modes of language, both formal and natural. Both argued the economics of 'the ordinary business of life' could not be captured adequately in formal models. ETP and Coase followed, recognizing something of their alignment but without examining each other's work (Pitelis, 2002b; Ravix, 2002).

ETP's new vocabulary was evident in LGSF but it was significantly elaborated as she finalized the TTGF manuscript. Her work was complicated by further family moves, first from Johns Hopkins to Australia on 'leave of absence' in May 1955 and back to Johns Hopkins in Dec 1955. In Oct 1956 ETP was elected to the university's General Assembly, securing her post. But then Pen, unhappy with the political situation in the US, decided to go to Baghdad to help establish a new national academic institution. ETP arrived in September 1957. The manuscript for TTGF was still not complete (A. Penrose, 2018:153). Despite her heavy teaching and administrative loads ETP's thinking was greatly enriched by her new analyses of the oil industry, visiting the Kirkuk oil fields, and her discussions with oil industry executives and national administrators, especially about the oil industry's political role and constraints (A. Penrose, 2018:156,157). She began to pay attention to the economics of 'sharing of rent between the host country and the foreign oil company' and Machlup was very encouraging (A. Penrose, 2018:159). This led to her *Role of Economic Analysis in Political Decisions* and to Chapters 10 and 11 of TTGF (A. Penrose, 2018; E. T. Penrose, 1958). It also led to the view that her work may be best seen as a theory of the international business firm (Blundel, 2015; Buckley & Casson, 2007, 2010; Dunning, 2003; E. T. Penrose, 2009:238; Pitelis, 2002a). Eventually, in 1958, copies of the finalized MS left Baghdad for her editor at Oxford University Press and for the Robinsons in Cambridge. That led to talk of offering ETP a Cambridge lectureship (A. Penrose, 2018:166). In Cambridge, Marris came across a copy of the MS by accident, read it, and was 'immediately attracted' (Marris, 1961, 2002; A. Penrose, 2018:166). In June 1959, the Penrose family motored back to Europe for the interview at Cambridge, leaving an Iraq in upheaval after the 1958 revolution. But no joy and failing to find work in England in spite of Robbins's efforts at LSE, the family headed back to the US.

In a series of papers, Yasemin Kor, Joseph Mahoney, and colleagues unpacked TTGF's vocabulary (Kor & Mahoney, 2000; Kor & Mahoney, 2004; Kor, Mahoney, & Michael, 2007; Kor, Mahoney, Siemsen, & Tan, 2016). They began by listing ETP's intellectual sources (Kor et al., 2016:1728). This essay's list is similar without being identical, Kor et al's included P. Sargent Florence as a connection to Marshall, and Walter Heller's 1951 HBR article (Heller, 1951). They identified 14 distinct ideas underpinning ETP's language:

Idea #1: Firms are institutions created by people to serve their purposes.

Idea #2: Firms operate in disequilibrium and seek to maintain administrative coordination within a multi-stakeholder environment.

Idea #3: A firm is a collection of productive resources and the services made available from these resources are the drivers of the firm's uniqueness.

Idea #4: Managers play a central catalyzing role in the resource-service conversion process.

Etc. (Kor et al., 2016)

Kor et al's methodology was 'subjective', interpretive or hermeneutic, a study of the language ETP and others used, pointing out the words, terms, and meanings that ultimately coalesce into ETP's discourse (Foss, Klein, Kor, & Mahoney, 2008; Kor et al., 2016). Social studies have recently seen a 'turn to rhetoric', something of a rebalancing away from the rush to rigorous positivist methods (Barglela-Chiappini, 2009; Brown, 1990; Cooren, Kuhn, Cornelissen, & Clark, 2011; Hardy, Lawrence, & Grant, 2005; Schoeneborn, Vásquez, & Cornelissen, 2016; Simons, 1990). This was not so much novel as recovering the pluralism of the earlier ethnomethodological tradition of social science. Spender used similar older methods to identify 'industry recipes' (Spender, 1989). In that research, around 14 or 15 axioms proved adequate to characterize a particular industry's strategic vocabulary and discourse. Fewer axioms and the vocabulary was too clumsy to capture the subtleties of the industry's strategic challenges and opportunities. More and the vocabulary got overly complicated and the sense of the industry disappeared beneath the individual firms' uniqueness.

In Marshall's sense the 'industry recipe' characterized 'a forest'. It presumed a level of analysis 'above' that of the industry's firms but 'below' that of the socio-economy. The aim of 'industry recipe' research was to show how industries differed in language and concepts, and thus to explore

how a firm's managers constructed their own firm's idiographic language (jargon) to make sense of their world. Note Marshall's 'representative firm' was neither 'the average firm', nor 'what all the industry's firms have in common'. It was an 'ideal type' created to support Marshall's analysis of a specific industry's equilibrium within the larger socio-economy. The 'industry recipe' was closer to what that industry's firms have in common, but it had no economic implications. Rather it was about comparing different industries' managerial agency and languages. Marshall's analysis was economic, bridging between an industry's equilibrium and its constituting firms' heterogeneity. It was not about comparing real firms.

ETP's analysis was different again, at the 'lower' firm-level of analysis, seeking general tendencies, such as in the 'Penrose Effect', without being contingent on or characterizing the firm's industry. To repeat 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). External circumstances or causes would not be independent and objective but viewed through the 'firm's nature'. ETP wrote she 'appropriated' Boulding's *Image* (E. T. Penrose, 2009:5n6). But she might also have recalled coming across FHK's earlier use of the same metaphor and that Boulding was a student of Knight's (Knight, 2006:201). Boulding's discussion of his 'new science of eiconics' cited Chester Barnard's book warmly, but not FHK (Boulding, 1956:153). But given uncertainty and the impossibility of seeing things as they are, managers would see their firm and its world through the unique 'image' they had created. This emphasized her project's implicit relativism or subjectivism: "Each 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). Recipe methods suggested the evolution of an industry could be tracked by observing how the industry's language evolved. Like all historical methods, there could be no predictive implication save, possibly, observing its language disintegrating as the industry itself was no longer able to make sense of what was happening. ETP did not move in this direction.

In Keynes's terms, ETP's research methods fused the three modes of analysis; the search for potentially formalizable general relationships, appreciation of the changing political-economic context, and, by identifying agentic managers, axiomatizing their economic and administrative artfulness. The shift to ethnomethodological methods raised questions about the researcher's purposes. As with Marshall, Keynes's purpose was to develop an economics 'useful to those

engaged in the ordinary business of life'. Foss told how this user-oriented (and ethically infused) project was overtaken by the economic profession's hunger to match natural science's rigorous (and non-ethical) methods; its so called 'physics envy' (Mirowski & Nik-Khah, 2017). As the economics professions' methods changed, so did its purposes. Marshall's 'useful' pluralist methods, which flowed into the thinking of Keynes, Knight, Coase and both Penroses, were eventually erased in the search for mathematical rigor that Friedman memorialized. The history of this shift is complex, though well-known and mostly beyond the reach of this essay (Backhouse & Fontaine, 2010; Mirowski & Nik-Khah, 2017). ETP was moving against the profession's direction, searching instead for a 'useful' analysis. But useful to whom, managers or economic theorists? (E. T. Penrose, 2009:2). Well aware of the shifts evident in Foss's story, she was encouraged by the changes she saw as the non-traditional ToFs Machlup identified, particularly 'evolutionary thinking', became more visible in business schools, if not in economics departments (Foss, 1994b; E. T. Penrose, 2009:235). Exploring the profession's change in methodological preference was complicated by the fact that Marshall was a pluralist with a plurality of objectives, as his interactions with Keynes showed; he pursued both usefulness and rigor. As Raffaelli explained, rather than being ambivalent about the possibility of a 'science of economics', Marshall pursued this science but maintained it could never be more than part of human understanding, never the whole (Raffaelli, 2003; Raffaelli, Becattini, & Dardi, 2006). Thus, Marshall always kept the possibility of a rigorous science in mind. FHK's, Coase's, and ETP's discussions about the limitations of scientific methods in economics followed in Marshall's steps.

Until that hoped-for science arrives, the ways in which economics might be of use remain complicated. Science aspires to objectivity, to make the specific researcher's or user's purposes irrelevant. Science presumes causes have determined consequences that have nothing to do with the actors' interests, nature rules. Science's facts are a-ethical tools to all purposes. Institutionalism is different, it integrates peoples' knowledge with their purposes, infusing their knowledge with unavoidable political and ethical implications. Thus, FHK argued 'behind every fact lies an interest' (Knight, 1922:479). Institutions are created by us in pursuit of our own interests. Accepting an institution's legitimacy is a political and ethical choice. We create institutions as responses to the uncertainties that disturb our condition (North, 1991). People differ and so face different uncertainties. Institutions are negotiated collective statements of legitimated purpose; they advance collective interest by moderating the pursuit of personal interests; we search for something bigger than ourselves. There are many types and modes of social institution, religious,

military, and legal as well as economic (Emmett, 2006; Rutherford, 2011). FHK focused on economic institutions or 'social organizations' (Knight, 2013). He saw markets as but one of the many types of economic institution that history reveals. Many economists see only markets and economic actors. FHK saw differing economic institutions created for different purposes. He had a special interest in markets because of the social and political freedoms they provided individuals. But markets would not be a society's only economic institution. FHK argued the family was the most basic of all economic institutions and, along with other productive systems, notably firms, had to exist before markets could arise (Kern, 1987; Knight, 2006:lv). FHK argued economics was the study of such alternative economic institutions as were politically available so as to examine their comparative social benefits (Emmett, 2010a; Knight, 2013:5). FHK laid the groundwork for Coase's comparison of markets and hierarchies. Economics, purpose, and ethics were thereby wrapped together.

For convenience we shall label the project to create an economics for the ordinary business of life the Marshall-Knight-Coase-Penrose (MKCP) project. Of course, these theorists learned from many predecessors such as Darwin, Smith, Spencer, and Turgot, as well as contemporaries such as Commons, Menger, Pareto, Schmoller, Weber, and Young. But the MKCP project was specifically to puzzle out an economics that would serve entrepreneurs within today's socio-economy - because the private firms they created were judged (a) beneficial to those impacted and (b) socially and politically legitimate institutions. If there was a rigorous science of economics, there would be no use for such institutionalized knowledge or process. The analyst would be in the condition of 'perfect knowledge' that underpins most neoliberal economics. FHK and Coase both suspected neither firms nor markets could exist. In contrast, the MKCP project presumed the uncertainties that characterize the 'ordinary business of life' even though they are denied by many micro-economists.

The MKCP project's aims reached beyond the freedoms on which Knight focused to include more mundane matters, services, jobs, satisfactions, aspirations, and so on. Following Keynes's prescription, such economics must do more than spell out the science-like relations involved. First, the entrepreneur's choices should include whatever science can be brought to bear, given the firm's processes are in the physical world, not mere abstractions of mind. The MKCP firm has an ontology that constrains the entrepreneur's imagination. But the choices also include political, social, and ethical judgments that follow from the firm's acting within a community of others, having an impact

on others' lives. The entrepreneur confronts an 'opportunity space' demarcated by many incommensurate choices involved in acting in the real non-blackboard world. The MKCP project's purpose was not to model or determine optimal economic behavior. Rather, it was to help the entrepreneur 'frame' the opportunity space of socially arising uncertainties s/he chooses (strategizes) to engage. The analysis is intended to clarify why and how the entrepreneur's imagination and language might be 'thrown' into that opportunity space, causing change in others in the pursuit of gain. The language would help the entrepreneur (and economist) choose what to pay attention to and what to ignore; it would not dictate their choices. The opportunity space illuminates the balance between the entrepreneur's agency and what is otherwise determined (Spender, 2014).

Kor et al set out from the Penrose Effect, that the rate of firm growth is restricted by the rate of managerial learning, or that "a firm that expands faster than it can increase its internal managerial capacities is likely to incur managerial problems" (Kor et al., 2016:1736; Thompson & Wright, 2005:58). They went on to tabulate various attempts made to formalize ETP's ideas, though without considering Buckley & Casson's work (Buckley & Casson, 2007, 2010). To interplay qualitative axiom discovery with quantitative or formal hypothesis testing is a perfectly legitimate academic activity, much evident in our research literature. But this was not what ETP was up to. Rather, TTGF offered a language generic enough to help all/most entrepreneurs understand connections between managerial experience, learning, firm growth and the constraints to growth.

Those trying to formalize ETP's thinking seldom explore who might benefit from the economics being created or rather they presumed the beneficiary would be the economics community pursuing the positivistic science of economics embedded in today's economics profession's institutions and practices. But as ETP's squabble with Alchian revealed, her aims were broader; whereas science foreclosed managers' agency, her methodology focused on extending and facilitating their choice. In the MKCP tradition, her goal was a better more open society, better production and distribution of economic goods, along with more personal freedom; a better unpinning for macroeconomics (E. T. Penrose, 2009:235). Much of FHK's writing focused on the paradoxes of freedom, memorialized in Isaiah Berlin's distinction between positive and negative freedoms (Berlin, 2017; Buchanan, 1982; Emmett, 2010b; Knight, 1929). Freedom only arises within constraints; complete *laissez-faire* is irrelevant to human freedom. Our identity is tied up with the interplay of freedom and constraint, some institutionalized, some residual to our ethics

(Knight, 1923). The MKCP project explored this interplay but stood on the presumption of the ethical burdens of choice ‘under uncertainty’. It is not possible to theorize the imagination, for it points to the boundaries between our reasoning and other modes of knowing. The entrepreneurial imagination can only be illuminated by seeing how it is constrained by what it must accept about its context.

An entrepreneur’s thinking begins with identifying the existing social, technological, legal, economic, and other constraints within which entrepreneurial freedoms might be exercised. But first, there must be opportunity spaces. Knight labeled this the continuous search for markets. ETP took the existence of demand for granted but was particularly interested in the possibilities in the ‘interstices’ between the zones of power of the socio-economy’s existing large businesses (E. T. Penrose, 2009:194). Second, there are the constraints, external and internal. Third, there must be interests. We can approach ETP’s language as a generalized ‘recipe’ for entrepreneurial activity in our capitalist democracy (E. T. Penrose, 2009:5). Since the recipe is a ‘whole’, each aspect supporting every other, it does not matter much where unpacking it begins (Spender, 2014). Rather than follow ETP’s sequence in TTGF, we can economize and list her axioms as Kor et al did. This is not an exercise in positivistic reductionism, though there is always the task of getting down as deep as possible. It is the search for a natural ‘economic language’ of entrepreneurship. Ultimately every axiom is a distinction between alternative ‘what-can-be-saids’ (Luhmann, 2002).

1. Economies of growth versus economies of size
2. Dynamics of open evolutionary real-world processes versus of abstracted decisions about structure, and design
3. Division of human heterogeneity, of human labor, and of the corresponding managerial capabilities
4. Managerial capabilities that transform heterogeneous resources into heterogeneous services
5. Each capability’s finiteness and indivisibility
6. The practical and mathematical impossibility of perfectly matching a bundle of finite resources to a real and finite need.
7. Managers enable various services to meet various needs, but practice may lead to them learning and generating new managerial capabilities
8. Practice means actors’ perceptions of time (and history) are learned and matter to future perceptions

9. Under-utilized resources and capabilities always seek their further application, driving growth shaped by interests

10. Managers' mental capacity to create new capabilities becomes a limiting or 'strategic' constraint to growth

11. Entrepreneur's capabilities and choices are extended and institutionalized into a firm by decentralization and delegation

12. The resulting division of labor is shaped, directed, and controlled through 'authoritative communication'

13. Entrepreneur's creative capacities are leveraged by forming a 'management team'

14. Team's capabilities are limited by its rate of learning and 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)

Some of 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 growth alone (Penrose 2009:5). Second, her narrowing the institutional context (Penrose 2009:5). Third, her inattention to principal-agent issues around managerial incentives (Penrose 2009: 236). Fourth, her inattention to principal-agent issues and other problems within the management team (Penrose 2009:236). But the most serious issues were around the deeply tautological nature of her analysis (Penrose 2009:6). These were of two types. First, her inattention to firms that did not grow, yet seemed in no particular way different from those that did - except that they did not grow. There was no other distinguishing feature or metric.

But by far the most serious difficulties were the consequences of her separating services from resources in her famous sentence (E. T. Penrose, 2009:25). Those of positivist disposition look in vain for a testable relationship grounded on something measurable. There was no testable relationship between resource/s and firm growth precisely because ETP separated them by services. There was no measure of management capability to transform resources into services, nor of management capability to transform services into growth. There was no testable theory of managerial or management team learning relating experience or time to capability or firm growth. The tautology was vicious; was there anything useful left?

The radical nature of her focus on the services the firm's resources provided rather than on

economists' traditional understanding of resources, defined by prices, separated her analysis from anything measurable and thus from mainstream economics. No question, TTGF spurred many to see TTGF as under-theorized (Kor et al., 2016:1738). Those trying to formalize TTGF were forced to presume the measurable variables they find in TTGF such as the formulae in Buckley & Casson and curves in Rubin, Slater, or Uzawa (Kor et al., 2016:1738). But these variables were far from the MKCP vocabulary. ETP seemingly skirted tautology without recognizing it was the inevitable consequence of an historicism or historical determinism that searches for testable causal (positivist) theories of historical processes (Parsons, 1968; Popper, 2002). Contrary to Buckley & Casson's claim that ETP's method was non-heterodox (Buckley & Casson, 2010:88; Casson & Buckley, 2010), we claim ETP's method was deeply anti-positivist, fundamentally institutional. Her empirical methods were historical and institutional too, as was her Hercules study. Note that her methods differed radically from Chandler's 'compare and contrast' study of the appearance of a new administrative method (divisionalization etc.) in 50 US companies (Chandler, 1962). In contrast to Chandler's intuition that growing firms in all industries needed to adapt their structure as their strategy changed, and thereby cope with rising diseconomies of scale, ETP was not searching for causal relations and predictability, such as Friedman argued was the essence of theorizing. Rather, like with the rest of the MKCP, she hoped to reveal real-world socio-economic tendencies that clarified the nature and application of real entrepreneurs' agency. Knowing something of these might help entrepreneurial managers create social arrangements that 'under uncertainty' served their own and society's interests better.

4. The Separation

A central puzzle in ETP's work was where her radical claim to separate services from resources came from, and she was remarkably silent on this. To pass over this question, to presume she thought of it herself does her no favors; to the contrary, it insults her hard studying, thinking, and resulting scholarship. These matters are among the everlasting problematics of Western philosophy, especially post-Enlightenment philosophizing about the nature of people and their freedom and agency. Had ETP added to this body of knowledge as did, say, Immanuel Kant, she would be due far greater honors than economists could possibly bestow. This section speculates on the separation's source in her work. There is no knowing for sure, of course, indeed she may not have known herself, or cared much. But it was her core axiom. It framed the specific uncertainty or

opportunity space into which the entrepreneur's imagination and agency was 'thrown'. It identified the boundary between the language of the market and the language of the firm, the place where resources became services.

Given this is the key to 'endogenous growth' there is some irony in the fact that while some see ETP as the author of the first theory of firm growth, the Economics Nobel for 'endogenous growth theory' went to Paul Romer in 2018². His key paper was *Endogenous Technological Change* (Romer, 1990). A critique is beyond this essay but Romer's thesis seemed to overlook firms and entrepreneurs and be more (a) a return to the imperfect monopoly theorizing dismissed by Foss, and (b) an argument for externally driven technological change, a variation on Marshall's 'external economies' (Foss, 1994a). Romer's grasp of Marshall's work seemed one-sided and problematic (Romer, 1987). But Romer's methods were formal and this might help explain why his work was honored. It also seems Penrose was not cited once in his entire *oeuvre*, confirming his work had no place for uncertainty, imagination, judgment, or entrepreneurship. Yet where else might technological progress come from, even as Romer claimed to make 'knowledge growth' central?

One speculation about the separation's source was that ETP was sensitized to the 'economics of learning' by Pen's work. A decade before meeting ETP he investigated how the Japanese people had increased their country's food supply and 'holding capacity' far beyond what agricultural economists theorized possible. It seems they had learned something these economists did not know. But this was no agricultural technology breakthrough. It was deeply institutional. The entire set or bundle of national institutions, religious, legal, social, technological, agricultural, and so on coalesced into a specific mode of life that fell outside the Western agricultural theorists' frameworks (E. F. Penrose, 1929, 1934). It was a '*weltanschauung*' or worldview to which Western economists were not privy. Though at a 'lower level', ETP's firm was just such an idiographic worldview, defined and bounded by its idiosyncratic language (Spender, 2014). Another speculation is that she found the separation in Marshall where, as we often hear, everything about economics can be found. Raffaelli unpacked Marshall's 'model of learning' laid out in *Ye Machine* (Raffaelli, 2003:28). Its essence was the interplay of imagining and routinization, a notion re-appearing in Herbert Simon's writings and Richard Nelson and Sidney Winter's evolutionary theorizing (Nelson & Winter, 1982; Simon, 1958; Spender, 2013). TTGF offered no theory of learning, managerial or team, rather ETP simply presumed one that merged Marshall's two modes.

² <https://www.nobelprize.org/prizes/economic-sciences/2018/romer/lecture/>

The separation came from elsewhere.

FHK followed Marshall in many matters but not all. In RUP's Chapters IV and V he explored the difference between capital and the services it provided when wants could be created and were not 'given' as in classical economics. His crucial step was to focus on the link between provider and consumer as a matter of knowledge 'under uncertainty' and thus malleable, not given, that a pig's ear might be sold as a purse and thereby provide services unimagined by the happy butcher. In RUP's Chapters IX and X FHK explored how the presence of uncertainty shifted the emphasis from priced resources to the flexibility and extensibility of the institutional rights and obligations constraining their use. Coase's famous remarks about the alternative uses of a cave reflected his alignment with these views (Coase, 1959:25). FHK's thinking led directly to his position on 'capital' as 'fluid' and to his squabble with the Austrians (Knight, 1934; 2006:325). One implication was that FHK could not accept Marshall's 'external economies'. Entrepreneurship, and thus the growth of the firm, was driven entirely by the entrepreneur's agentic judgments about the processes of providing and consuming services, not by taking advantage of 'external economies'. Most importantly the entrepreneur's judgments about others were crucial because they constrained the division of the labor of dealing with the uncertainties the entrepreneur had chosen to engage (Knight, 2006:292; Spender, 2018). This drove a wedge between machine models of administration and those of persuasion, between (a) the division of labor known, and (b) the division of the labor of imagining and dealing with uncertainty. This distinction directing and imagining was obscured in ETP's notions of 'authoritative communication'.

There was no indication that ETP studied FHK's work deeply, indeed Machlup's disagreements with FHK might have dissuaded her. But her reading of RUP, cited in TTGF, may well have sensitized her to the consequences of introducing uncertainty into the Marshallian analysis she knew. She may have found the *Preface to the Re-Issue* in the opening pages of the 1933 edition of RUP of special relevance, given her rejection of the 'economies of scale' arguments (Knight, 2006:xiii). FHK likewise took issue with Pigou on this, as Coase did later, and pointed out the relationship between efficiency and size is 'one of the most serious problems of theory'. He argued "Generally speaking the expansion of a firm ... cannot be represented by a reversible functional relation" (Knight, 2006:xxiii). He went on to dismiss mechanical models and bring management knowledge and learning central (Knight, 2006:xxv). He argued "The basic economic magnitude ... is service, not good" (Knight, 2006:xxvi). Likewise, "All goods are indirect; only services are

consumed, and all goods are significant through yielding or producing services” and “There are no ultimate productive resources” (Knight, 2013:44,63). Finally, obliquely, but sufficient to our essay’s purposes, “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).

ETP did not travel with the MKCP project as it advanced towards New Institutional Economics (NIE). Her work is not seen as contribution. NIE’s most defining development was ‘transaction costs’, generally attributed to Coase but already evident in FHK’s work. These costs bear on the question of into which services should the firm’s available resources be transformed and how. They would have added additional axioms and depth to ETP’s analysis. Unfortunately, the popular view, largely derived from Williamson’s work, that firms exist as apparatuses that lessen the transaction costs that would be incurred if the same transactions were conducted in markets, has diverged fundamentally from the MKCP project (Williamson, 2010). If transaction costs are non-zero but determinable, they are only arbitrarily distinguishable from the firm’s other factor costs. They cannot ‘explain’ the entrepreneur’s choice between firm or market arrangements (Spender, 2018). Plus, the firm has to exist before these costs can be known and compared. If, in contrast, transaction costs are not determinable, but are matters of entrepreneurial valuation and judgment, calling for judgment rather than computation, then the analysis shifts from formalism into pluralism.

The MKCP project explores how pluralist thinking might aid entrepreneurs’ practical art, illuminate their experience of the ordinary business of life. Non-zero transaction costs also help clarify the conceptual distance between the resource-based view (RBV) and ETP’s thinking. Many have argued that aside from Birger Wernerfelt’s serendipitous borrowing of ETP’s notion of the firm as a ‘broader set of resources’, there is little of ETP’s thinking in the RBV literature (Foss, 1999; Kraaijenbrink, Spender, & Groen, 2010; Rugman & Verbeke, 2002, 2004; Wernerfelt, 1984:171). There does not appear to be any firm in the RBV, nor mechanisms to transform resources in services or profits, so no ToF and no transaction cost analysis beyond the tautology that VRIN resources earn sustainable rents (Conner, 1991; Conner & Prahalad, 1996; Priem, 2001; Priem & Butler, 2001). The RBV’s tautology is even more vicious than that in ETP’s analysis since time, evolution, and history, and all questions about the acquisition, integration, deployment, and transformation of VRIN resources, are excised (Barney, 1986, 1994; Barney & Mackey, 2005; Grant,

1996).

Non-zero transaction costs also bear on ETP's methods. There was no sign that her fondness for Marshall led her to read Keynes's *Scope and Method* (Keynes, 2011). Her comments on research method in TTGF and in her 1958 Baghdad paper imply rigorous and interpretive methods were viable alternatives. Most social scientists take this view, debating whether the methods complement each other for fuller understanding (triangulate) or are categorically distinct and so set out incompatible research projects. But in the real world in which transaction costs can never be zero, the debate is different. Costs are many dimensioned, calling for entrepreneurial judgment in their estimation. Keynes's triad of (a) formal theory, (b) political-economic (institutional) research, and (c) agentic art limited the relevance of formal theorizing in precisely the way FHK, Coase, and ETP argued. Blackboard economics stands apart from the real-world analyses grounded on Keynes's pillars. As noted above, institutional analysis is never determinative. Executive art is always required when transaction costs are positive. Entrepreneurial capabilities are costly, though not necessarily in the monetary and quantifiable 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). Coase's terse comments in his *Nature of the Firm* were ambiguous, yet putting deals together is always a matter of entrepreneurial judgment, and always takes time. It is never simply a matter of computing measurable costs (Coase, 1937:390). FHK's and Coase's focus on alternative social organizations embraced these arrangements' comparative transaction costs pluralistically. It was too bad ETP never got to study FHK's or Coase's work closely enough to ponder the impact of positive transaction costs on her thinking. Given her fieldwork and deep familiarity with the executive process she would surely have found it exciting.

Finally, we can see FHK and ETP shared their political awareness and made it central to their notions of economics. FHK visited Germany in 1913 to study the work of Gerhard Hauptmann, the Nobel winning playwright of working-class life. This and his religious background helped him develop his life-long interest in ethics and social philosophy, which studies occupied the last half his career (Emmett, 2009b). ETP was a labor activist in her youth, travelled widely, and saw revolution up front in Iraq (A. Penrose, 2018). For both of them economics could only be useful if it was politically and ethically informed, and so a long way from the mainstream's blackboard. ETP's other intuitions were apposite, she realized all business thinking would be global long before international business became established in business schools (Dunning, 2003). But she could not

have anticipated the remarkable transformation of investment behavior we associate with today's fantastic valuations of growth-defined unicorns and GAFAs firms. Investors have come to value growth over revenue, even of firms that 'cash-suck' rather than 'cash-cow', placing the promise of growth ahead of all bases for 'theories of the firm'. Microeconomics has yet to respond to this counter-intuitive new 'business of life' (Mokyr, 2017).

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