

# Organizing Entrepreneurial Judgment

A New Approach to the Firm

NICOLAI J. FOSS

Copenhagen Business School and Norwegian School  
of Economics and Business Administration

PETER G. KLEIN

University of Missouri and Norwegian School  
of Economics and Business Administration



CAMBRIDGE  
UNIVERSITY PRESS

CAMBRIDGE UNIVERSITY PRESS  
Cambridge, New York, Melbourne, Madrid, Cape Town,  
Singapore, São Paulo, Delhi, Tokyo, Mexico City

Cambridge University Press  
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

[www.cambridge.org](http://www.cambridge.org)

Information on this title: [www.cambridge.org/9780521697262](http://www.cambridge.org/9780521697262)

© Nicolai J. Foss and Peter G. Klein 2012

This publication is in copyright. Subject to statutory exception  
and to the provisions of relevant collective licensing agreements,  
no reproduction of any part may take place without the written  
permission of Cambridge University Press.

First published 2012

Printed in the United Kingdom at the University Press, Cambridge

*A catalog record for this publication is available from the British Library*

*Library of Congress Cataloging in Publication data*

Foss, Nicolai J., 1964–

Organizing entrepreneurial judgment : a new approach to the firm /  
Nicolai J. Foss, Peter G. Klein.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-521-87442-7 – ISBN 978-0-521-69726-2 (pbk.)

1. Industrial organization (Economic theory) 2. Entrepreneurship.

I. Klein, Peter G. II. Title.

HD2326.F667 2012

338'.0401–dc23

2011038183

ISBN 978-0-521-87442-7 Hardback

ISBN 978-0-521-69726-2 Paperback

Cambridge University Press has no responsibility for the persistence or  
accuracy of URLs for external or third-party Internet websites referred to in  
this publication, and does not guarantee that any content on such websites is,  
or will remain, accurate or appropriate.

# Contents

<i>List of figures</i>	<i>page</i>	vii
<i>Preface</i>		ix
1	The need for an entrepreneurial theory of the firm	1
	The theory of the firm in economics	3
	Entrepreneurship	5
	Why entrepreneurship and the (theory of the) firm belong together	8
	An overview of our narrative	15
2	What is entrepreneurship?	23
	The enigmatic entrepreneur of economic theory	24
	Concepts of entrepreneurship and the firm	28
	Conclusion: entrepreneurial judgment as a natural complement to the theory of the firm	41
3	Entrepreneurship: from opportunity discovery to judgment	43
	The Austrian school of economics	45
	Kirzner and entrepreneurial alertness	55
	Kirzner and the management research literature on entrepreneurship	72
	Conclusions	76
4	What is judgment?	78
	Knightian uncertainty	81
	Judgment: purposeful behavior under uncertainty	91
	Judgment, complementary investments, and the unit of analysis in entrepreneurship research	100
	Conclusions	103
5	From shmoo to heterogeneous capital	105
	Entrepreneurship and organization in a world of shmoo capital	107

	Austrian capital theory: an overview	113
	Capital heterogeneity: an attributes approach	116
	Entrepreneurial judgment in the context of a complex capital structure	121
	Conclusions	129
6	Entrepreneurship and the economic theory of the firm	131
	Entrepreneurship and the theory of the firm: why so little contact?	133
	Established theories of the firm	136
	The modern theory of the firm and entrepreneurship	146
	Entrepreneurship as an unrealized potential in the theory of the firm	156
	Conclusions	161
7	Entrepreneurship and the nature and boundaries of the firm	163
	The emergence of the firm	164
	The boundaries of the firm	175
	The dynamics of firm boundaries	178
	Economic calculation, judgment, and the limits of organization	181
	Conclusions	186
8	Internal organization: original and derived judgment	188
	Original and derived judgment	192
	Derived entrepreneurship: productive and destructive	197
	Implications for economic organization	207
	Dispersed knowledge, authority, and firm organization	213
	Conclusions	219
9	Concluding discussion	221
	Introduction	221
	Implications for entrepreneurship theory	223
	Implications for the theory of the firm	231
	Implications for public policy	240
	Final remarks	248
	<i>References</i>	250
	<i>Index</i>	293

# 1 *The need for an entrepreneurial theory of the firm*

The theory of entrepreneurship and the theory of the firm should be treated together. And yet, the important connections between these two bodies of literature have been largely overlooked. This is our book's basic motivation.

How, then, are entrepreneurs and firms connected? Do entrepreneurs need business firms to carry out their function? Or, do firms need entrepreneurs to survive in the competitive market process? And if there is a role for the entrepreneur in the firm, what is it, exactly? Where in the firm does entrepreneurial activity mainly take place? How does the organization of the firm influence entrepreneurial actions? Are business firms run by entrepreneurs, or rather by hired managers? How does firm organization (e.g., the allocation of residual income and control rights) affect the quantity and quality of entrepreneurial ideas? Can entrepreneurship be a property of a managerial team – or is it strictly an individual phenomenon?

To practitioners, policymakers, and other non-specialist readers, these questions seem to strike at the very core of our understanding of markets – price theory, industrial economics, strategic management, organization theory, even marketing and finance. Entrepreneurial behavior does not, after all, occur in a vacuum. Entrepreneurs, like other economic actors, employ scarce means to achieve their objectives, must economize on these means, must evaluate trade-offs at the margin, and so on.<sup>1</sup> Moreover, as both entrepreneurship and the theory of the firm deal with business ventures, new firm formation, new as well as sustained value creation, etc., one would expect substantial

<sup>1</sup> As we will see in Chapter 2 and elsewhere below, several important entrepreneurship theories abstract from scarcity, treating entrepreneurial ability as an extra-economic attribute or function that cannot, itself, be analyzed as a scarce resource. Even so, entrepreneurs need complementary factors of production – land, labor, capital – that are subject to the usual laws of supply and demand.

cross-fertilization to take place, simply because so many important, practical research questions appear at the intersection of these two fields. And yet, the study of entrepreneurship and the study of organizing in the economy lack contact. Indeed, the modern theory of the firm ignores entrepreneurship, while the literature on entrepreneurship in economics and management research has limited use for the economic theory of the firm.

As a result, there is no serious theory of the entrepreneurial firm to guide decision-making for the kind of problems that intimately involve both entrepreneurship and organizing. To be sure, there are theories of start-up firms in economics and in management and large literatures on product, process, and organizational innovation. But mature firms, as well as new firms, act entrepreneurially – witness the emphasis on “corporate renewal” and “entrepreneurialism” among practitioners – and entrepreneurship reveals itself in many activities besides innovation. Even non-market actors, including public officials, philanthropists, and university professors, are urged to be “entrepreneurial.”

A good theory of entrepreneurship should explain the conditions under which entrepreneurship takes place, the manner in which entrepreneurship is manifested, and the interaction between entrepreneurial activity and firm, industry, and environmental characteristics. In the contemporary entrepreneurship literature, entrepreneurship is typically seen as a theory of firm creation; once created, however, the firm ceases to be “entrepreneurial” and becomes dominated by “managerial” motives – a partial legacy of Schumpeter’s early and influential work on innovation (Schumpeter, 1911). However, processes of firm formation, growth, and ongoing operation are continuous, and things that matter at the early stages do not disappear overnight. A holistic view of entrepreneurship thus requires an understanding of the managerial and organizational aspects of the entrepreneurial function. In like manner, we think the economic theory of the firm can be improved substantially by taking seriously the entrepreneurial aspects of firm organization and strategy. In sum, the theory of entrepreneurship and the economic theory of the firm have much to learn from each other. However, they must first be brought into contact.

Prompted by what we see as a fundamental disconnect between these two strands of research literature, each of which has much to learn from the other, our basic aim in this book is to describe and

exploit gains from trade by bringing entrepreneurship and the (theory of the) firm much closer together, to the benefit of both, as well as the fields and disciplines in which they are embedded. We see few substantial obstacles to doing so. The conventional separation between entrepreneurship and the theory of the firm is not due to any inherent incompatibility, but is largely an idiosyncratic consequence of the way the field of economics developed, particularly after WWII. Indeed, there is a certain historical irony in this separation because one of the key early contributions to the economic theory of entrepreneurship, Frank H. Knight's *Risk, Uncertainty and Profit* (1921), is also a pioneering analysis of basic issues about firms, markets, and competition that contemporary economists view as the foundational questions of the theory of the firm.

However, both the theory of the firm and the theory of entrepreneurship developed in a way that the original Knightian program of providing a unified treatment to the firm and the entrepreneur became stalled. Our overall aim is to revitalize this Knightian program. In the remaining part of this chapter, we further explain the need for such an integrated undertaking, describe some of the historical and disciplinary reasons why integration hasn't yet taken place, and provide a summary of our positive argument.

## The theory of the firm in economics

The economic theory of the firm – also known as the economics of organization or organizational economics – is a well-established and influential area of economics. Thus, transaction-cost economics (Williamson, 1985), agency theory (Holmström, 1979), mechanism design, the nexus-of-contracts approach (Jensen and Meckling, 1976), and the property-rights theory of the firm (Hart and Moore, 1990) are now part of the standard discourse among academics, students, and practitioners studying firms and markets.<sup>2</sup>

In the management literature, resource and knowledge-based views of the firm have come to dominate the analysis of organizational performance (Wernerfelt, 1984; Barney, 1986, 1991; Peteraf,

<sup>2</sup> We here follow standard practice and include agency theory under the “theory of the firm,” although strictly speaking this theory is not about the existence and the boundaries of firms (Hart, 1989).

1993; Peteraf and Barney, 2003), theories that in various ways build on earlier theories of the firm, be they behavioral (Cyert and March, 1963), evolutionary (Nelson and Winter, 1982), or neoclassical economic (Demsetz, 1973). Moreover, the economic theories of the firm mentioned above have also been hugely influential in management research for a long time (see Mahoney, 2005). Rumelt (1984) long ago argued that strategic management should rest on the “bedrock foundation” of the “economist’s model of the firm.” Many scholars in strategic management and neighboring fields followed his call (Foss, 1999; Becarra, 2009).

In short, the economic and managerial analysis of the firm is a vibrant area of research and application characterized by a diversity of competing theories and approaches and a robust empirical literature. Of course, the firm has long been central to economics, in the theory of production and exchange, the analysis of industry structure, labor economics, and a few other areas. Introductory textbooks all contain a section on the “theory of the firm” containing the familiar equations and diagrams describing the firm’s production possibilities set, its cost and revenue curves, and the equilibrium pricing and production decisions. Firms are useful in basic economics because they are necessary parts of doing price theoretical analysis (Machlup, 1963). When economists address the industry- or economy-wide consequences of, say, a change in the price of an input, the analysis involves addressing how a representative firm will react to the change in terms of input substitution, product price, and so on.<sup>3</sup>

However, the theory of the firm as a contractual or organizational entity – the literature on the existence, boundaries, and internal organization of the enterprise spawned by Ronald Coase’s “The Nature of the Firm” (1937) – is, in the history of economics, a relatively recent development. As discussed in Chapter 6 below, the economics of business organization emerged as a distinct field only in the 1970s with

<sup>3</sup> The idea of the “representative firm” comes from Marshall (1890), who imagined an entity that “has had 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; account being taken of the class of goods produced, the conditions of marketing them and the economic environment generally.” See Foss (1994a) on the role of this heuristic device in Marshallian and post-Marshallian thought more generally.



the path-breaking contributions of Williamson (1971, 1975, 1979), Alchian and Demsetz (1972), Hurwicz (1972), Marschak and Radner (1972), Ross (1973), Arrow (1974), Jensen and Meckling (1976), Klein, Crawford, and Alchian (1978), Holmström (1979), and others. Once economists realized they needed a theory of economic organization, the theory of the firm in this Coasean sense became part of the canon, and arguably one of the theoretical and empirical success stories of economics.<sup>4</sup> In important respects, as we argue below, the theory of the firm can further the entrepreneurship field, fundamentally because it addresses important issues regarding the locus of entrepreneurship that have not been addressed in entrepreneurship research.

## Entrepreneurship

More recently, the analysis of entrepreneurship has seized the spotlight in economics. Other social sciences, including sociology (Thornton, 1999), anthropology (Oxfeld, 1992), political science (Klein, McGahan, Mahoney, and Pitelis, 2010), and economic and business history (Landes *et al.*, 2010), have begun to explore the entrepreneurial concept as well. In business schools, entrepreneurship is starting to be incorporated into management, marketing, finance, and accounting, rather than being a standalone program on new firm formation (business plan writing, venture funding, technology transfer, and the like). Indeed, the last decade has witnessed an explosion of university courses, faculty positions, research and educational centers, journals, publications, and grant funding dedicated to the study of entrepreneurship. Economists increasingly see entrepreneurship as a key to technological progress, and (therefore) an important part of the growth process (e.g., Blau, 1987; Aghion and Howitt, 1992; Baumol, 1994; Wennekers and Thurik, 1999; Blanchflower, 2000).

Recognition of the entrepreneur's importance predates even the *Wealth of Nations*, playing a central role in Richard Cantillon's (1755) pioneering treatise. One might thus expect the entrepreneur to be central to economic theorizing over the last two-and-a-half centuries. However, as we will explain later, this has not been the case; on the contrary, at least since WWII entrepreneurship has been left

<sup>4</sup> The term "success story" is Williamson's (2000: 605), describing the empirical work in transaction cost economics.

out of the economics mainstream, only be stressed by prolific and perhaps well-known, yet “heterodox” (and therefore rather uninfluential) economists, notably Austrian (e.g., Mises, 1949; Hayek, 1968; Kirzner, 1973) and Schumpeterian (Futia, 1980; Nelson and Winter, 1982). In fact, in spite of the appearance of two seminal papers about three decades ago that provided two fundamental “recipes” for modeling entrepreneurship in its self-employment sense (Lucas, 1978; Kihlstrom and Laffont, 1979), it is only over the last decade or so that mainstream economists have become seriously interested in the entrepreneur.

While it is widely recognized that formal modeling of the mainstream economics variety cannot do full justice to entrepreneurship,<sup>5</sup> at least some aspects of entrepreneurship can be captured using the standard tools of equilibrium and constrained maximization. An issue that has received much attention is the analysis of occupational choice (e.g., Holmes and Schmitz, 1990) and its implications for a host of policy issues (e.g., the incentives of minority groups to become entrepreneurs, access to credit as an entry barrier, the relative contribution to innovation of small and large firms, etc.). This research stream is virtually synonymous with contemporary economics research on entrepreneurship. Some work has also considered issues of direct relevance to management research, such as entrepreneurial learning (e.g., Parker, 1996). Overall, entrepreneurship is becoming a legitimate research subject in economics.<sup>6</sup>

The situation in management is similar in a number of respects. Entrepreneurship has long been an established field in management studies, but research in this area has been substantially transformed in the last decade. To some extent this is a result of a much closer liaison with strategic management (Baker and Pollock, 2007), giving rise to the field of strategic entrepreneurship.<sup>7</sup> But it is also, and

<sup>5</sup> Bianchi and Henrekson (2005: 354) survey many of the mainstream models of entrepreneurship and conclude that in these models “entrepreneurship is invariably narrowly defined and it cannot be said to capture the wide-ranging and complex functions suggested outside mainstream economics.”

<sup>6</sup> Parker (2005) provides an excellent overview of recent entrepreneurship research in economics.

<sup>7</sup> Evidence for the spread of entrepreneurial ideas to strategic management research includes the 2008 launch of the *Strategic Entrepreneurship Journal*, a sister journal to the highly prestigious *Strategic Management Journal*. Representative strategic entrepreneurship papers include Hitt and Ireland

perhaps much more importantly, a matter of a drastic transformation of the field of entrepreneurship itself. While early research was mainly taken up with the management of small and family business, more recent research – drawing on insights from psychology, economics, and sociology – is directed toward a broader set of issues, theories, and phenomena, with more attention to defining constructs, formulating precise research questions, and establishing standard research procedures (see Shane [2003] for an overview).

This raises a more general issue: What, exactly, is entrepreneurship? An easy way of delineating different types of entrepreneurs and economic theories of entrepreneurship is to distinguish between those that define entrepreneurship as an *outcome* or a phenomenon (e.g., self-employment, start-ups) and those that see entrepreneurship as a *way of thinking or acting* (e.g., creativity, innovation, alertness, judgment, adaptation).

Much early work on entrepreneurship (e.g., Schumpeter, 1911; Knight, 1921) falls into the latter category, what Klein (2008b) calls “functional,” in the sense that entrepreneurship was invoked as a necessary step to explaining other phenomena such as economic development (Schumpeter) or the existence of the firm and profit (Knight). Because the entrepreneur was merely a necessary analytical stepping stone to understanding other phenomena, typically at higher levels of analysis, they were treated in rather abstract, stylized terms. This is highly akin to the treatment of the firm in basic price theory (Machlup, 1967), where the firm receives a similarly abstract treatment. Some modern work in economics on the entrepreneur, specifically, Kirzner’s (1973, 1985, 1992), has also treated the entrepreneur in highly abstract terms – and for similar reasons: In these approaches the interest is not in the entrepreneur per se, but in those phenomena that the presence of the entrepreneur help to explain. Moreover, these approaches do not pay much attention to the antecedents of entrepreneurial activity (Bjørnskov and Foss, 2008).

In contrast, the management research literature on entrepreneurship (and some work in labor economics) has given much more detail

(2000), Ahuja and Lampert (2001), and Ireland, Hitt, and Sirmon (2003).

Foss and Lyngsie (2011) survey the strategic entrepreneurship field and discuss its relations to neighboring fields and theories such as the resource-based and dynamic capabilities views.

to the entrepreneur and entrepreneurial actions, describing the decision heuristics he makes use of (Sarasvathy, 2003), the biases he may suffer from (Busenitz and Barney, 1997), the experience base for his actions (Shane, 2000), the kind of uncertainty he confronts (Alvarez and Barney, 2010), the network structure that he is a part of (Sorenson and Stuart, 2005), his previous employment experience (Klepper, 2002; Braguinsky, Klepper, and Ohyama, 2009; Elfenbein, Hamilton, and Zenger, 2010), and so on. Much of this literature has been drawn to Kirzner's concept of entrepreneurship as "opportunity discovery" (Shane and Venkataraman, 2000), although, as we shall show (Chapter 2), this may be partially based on a misunderstanding of the nature of Kirzner's work.

### **Why entrepreneurship and the (theory of the) firm belong together**

#### *The firm as the locus of entrepreneurial activity*

The research literatures on the theory of the firm and entrepreneurship can, we believe, be brought together to form a better theory of the firm and a fuller understanding of the nature and economic effects of entrepreneurship. From this perspective, the questions that arise in the intersection of entrepreneurship and the theory of the firm relate to the *locus* of entrepreneurship.<sup>8</sup> In an influential and programmatic statement, Shane and Venkataraman (2000: 218) argued that management scholars in strategy and organization are fundamentally concerned with three sets of research questions, namely why, when, and how (1) entrepreneurial opportunities arise, (2) certain individuals and firms and not others discover and exploit opportunities, and (3) different modes of action are used to exploit those opportunities. These issues include the issue of "how the exploitation of entrepreneurial opportunities are organized in the economy" (2000: 224). When they wrote their paper, Shane and Venkataraman could point to little work moving the field forward along these lines. Nearly a decade later the situation is not much better, though the need for integration is increasingly realized. We argue that economic theories of the firm are

<sup>8</sup> It is perhaps telling that one of the most influential entrepreneurship journals is (still) called *Small Business Economics*.

particularly well-equipped to understand not only the “exploitation,” but also the discovery and even the evaluation of entrepreneurial opportunities. And these theories mesh even more closely with other approaches to entrepreneurship, as we shall see in later chapters.

One of our objectives is to explain, in this context, why entrepreneurs choose certain ways and not others for organizing their activities. These are questions that are becoming increasingly pertinent, as argued above, and, indeed, some of them are considered in the recent economics and management literature on entrepreneurship. However, they are only treated in a highly limited manner. Consider, for example, Lucas’ (1978) general equilibrium model, the starting point for much modern economics work on entrepreneurship. The model examines the matching of firms and entrepreneurial talent, given that entrepreneurial talent is unequally distributed. “Entrepreneurial talent” is really a portmanteau variable that includes entrepreneurial, managerial, and ownership skills. Lucas describes a matching between firm size and entrepreneurial talent, the most able entrepreneurs running the largest firms. This suggests one association – albeit a highly stylized one – between firm organization and entrepreneurship.

One may question whether making entrepreneurship a factor of production and conceptualizing it solely as a coordinating function is really in the spirit of the classics of entrepreneurship (see Bianchi and Henrekson, 2005: 358). More to the point, however, it is unclear in Lucas’ treatment why entrepreneurs would need firms at all. Why can’t they perform their coordinating function simply by using contracts? Why are the governance mechanisms of the firm required? A similar critique may be directed at another important treatment, Kihlstrom and Laffont’s (1979) model of self-employment. In this model, individuals differ in risk preferences but are otherwise identical. Picking up on a remark in Knight (1921) (on firm organization implying that the “venturesome” insure the “timid”), Kihlstrom and Laffont show the existence of an equilibrium with the population of agents divided into less-risk-averse entrepreneurs and more-risk-averse workers. Moreover, they link entrepreneurship to taking “responsibility for enterprise,” and therefore bearing risk. It is clear from their discussion that they think this happens in the context of firms. However, it is not obvious why people need to form firms to share risks, when they could just as easily do it through contract. By implication, much of the subsequent research based on these two

papers (and on Holmes and Schmitz, 1990) overlooks the issue of the locus of entrepreneurship in the proper comparative-institutional sense (Coase, 1964; Williamson, 1985): the relevant alternatives are not systematically identified and the net benefits compared.

Relatedly, most of the economics literature on entrepreneurship treats its *explanandum* as companies, implying that entrepreneurial activity ceases after the start-up phase. Much management research on entrepreneurship has simply *defined* entrepreneurship as the creation of new firms, or, more broadly: organizations. Either way, *established* firms are simply excluded from the set of entrepreneurial agents in the economy in very large parts of entrepreneurship research. However, as the recent strategic entrepreneurship literature argues, established firms may act in a highly entrepreneurial way, discovering and seizing new opportunities, exercising judgment over existing and potential resources, and introducing new products and processes (Hitt and Ireland, 2000). Seizing new opportunities through acquisition, divestiture, diversification, or refocusing constitutes a change in firm boundaries, one of the key issues in the Coasean theory of the firm. Or, established firms may wish to stimulate a kind of behavior inside the corporate hierarchy that seems fully “entrepreneurial” – what is often called “intrapreneurship” or “corporate venturing” in the management literature on entrepreneurship. Established firms can reorganize themselves by using incentive pay (Jensen and Meckling, 1992) or other devices such as “access” (Rajan and Zingales, 1998). This involves another key issue in the Coasean theory of the firm, namely that of internal organization.

As we have mentioned, management scholars in organization, strategic management, international business, etc. have often drawn eclectically on the theory of the firm. For example, many issues of strategic management (e.g., vertical integration or diversification decisions) are now routinely framed as problems of efficient governance. And among the most cited scholars in the top business administration journals is Oliver Williamson, perhaps the best-known representative of the modern theory of the firm (Williamson, 1975, 1985, 1996). However, if we turn our attention to recent management research literature on entrepreneurship, we see little on the *locus* of entrepreneurship, despite the earlier plea of Shane and Venkataraman (2000).

*Advancing the theory of entrepreneurship*

As noted above, over more than two centuries of social science work on entrepreneurship, entrepreneurship scholars have sometimes talked about entrepreneurship as an outcome (e.g., the creation of a new firm), and other times as a behavior (e.g., discovery, judgment, creativity). Empirical economics research on entrepreneurship typically adopts the outcome approach, mostly for pragmatic reasons (not surprisingly, outcomes are usually easier to observe and measure than behaviors). And yet, this approach may get it wrong, as when any new Mom and Pop store is counted as an entrepreneurial venture, whereas new innovative behaviors by established firms are not counted as instances of entrepreneurship.<sup>9</sup>

Scholars who adopt the behavioral or functional understanding of entrepreneurship have, since Cantillon, conceived it in various ways, such as innovation, alertness, uncertainty-bearing, adaptation, creativity, and leadership. Chapter 2 surveys these various theories and definitions and argues that one particular approach, the Knightian conception of entrepreneurship as judgmental decision-making, provides an explanation of the entrepreneurial function that can be more smoothly integrated with the economic literature on the firm than other conceptions of entrepreneurship. In management research, the dominant approach to entrepreneurship focuses on individuals' identification or discovery of profit opportunities, but pays less attention to the means by which such opportunities are exploited. It tends to focus on the cognitive and behavioral characteristics of individuals who establish new enterprises (e.g., Baron, 1998). A parallel stream of research, the "entrepreneurial orientation" literature (Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003), considers identification or discovery of profit opportunities at the level of firms. Neither of these two streams really focuses on the resources and capabilities necessary to transform opportunities or investments into realized profits. However, analyzing the resources used by entrepreneurs, both for the

<sup>9</sup> This problem plagues the major databases on entrepreneurial activity such as the Global Entrepreneurship Monitor. Some researchers and policymakers try to avoid the problem by focusing on start-ups in particular industries, such as information technology or pharmaceuticals. As an official at a major foundation supporting entrepreneurship research told one of us, "We're not looking for more restaurants and dry cleaners."

establishment of new ventures and the operation of existing ventures, sheds light on the manner in which perceived opportunities and real investments are transformed into value-creating activities.

More generally, entrepreneurship scholars in management are beginning to realize that entrepreneurship is closely linked to central issues of firm organization and strategy, not just to the particular management problems of small businesses (e.g., Shane and Venkataraman, 2000; Alvarez and Barney, 2005). Since Coase (1937) the fundamental issues in the economic theory of the firm have been taken as why firms *exist* (when non-firm, contractual means of allocating resources are available), what determines their *boundaries* (i.e., the allocation of productive activities across firms), and what determines their *internal organization* (i.e., organizational structure, reward systems, etc.). Thus, as we shall argue, entrepreneurial opportunities may be directly tied to why firms exist, because firms may be formed to exploit opportunities or facilitate entrepreneurial experimentation, and the allocation of ownership and property rights in firms may influence these activities within and across firms.

### *Advancing the theory of the firm*

For several decades, William Baumol has criticized economists for neglecting the entrepreneur. His oft-cited quip that “[t]he theoretical firm is entrepreneurless – the Prince of Denmark has been expunged from the discussion of *Hamlet*” (Baumol, 1968: 68) still rings true, even if the meaning of the “theoretical firm” has changed in the meantime.

The theory of the firm (under which we included, as noted above, agency theory, transaction-cost economics, and the property-rights view) has often been criticized for its static nature (e.g., Boudreaux, 1989; Langlois, 1992; Furubotn, 2001).<sup>10</sup> While there are important, subtle differences between these theories (Foss, 1993a; Gibbons, 2005), for instance concerning the role of unanticipated contingencies

<sup>10</sup> Note that we do not consider resource-based, knowledge-based, and dynamic capabilities approaches to be theories of the firm per se, as they do not generally focus on the Coasean issues of existence, boundaries, and internal organization of the firm. However, a few attempts at this exist within this literature (e.g., Kogut and Zander, 1992), but these attempts have not, so far, been successful. For discussion of these issues, see Foss (1999).



and process features (e.g., the “fundamental transformation” in Williamson, 1985), they share a largely static and “closed” ontology. Specifically, they focus on solutions to given optimization problems, avoiding questions about the origin of these problems, or indeed of the firm itself. They build on the assumption of a given means-ends framework. Entrepreneurship scholars have traditionally argued, explicitly or implicitly, that breaking with this assumption is a necessary step towards building a theory of entrepreneurship (Schumpeter, 1911; Knight, 1921; Mises, 1949; Kirzner, 1973).

It is quite likely that such arguments have contributed to the disconnect between economics, including the theory of the firm, and entrepreneurship. As Coddington (1983: 61) comments in a different context (the “radical subjectivist” critique of mainstream economics),

a consistent or all-embracing subjectivism is, analytically a very self-denying thing ... One could, of course ... spend a good deal of time and energy in trying to convince those who engage in macroeconomics, econometric model-building, mathematical economics, general equilibrium theory and so on, of the folly of their ways. But, that task accomplished, there would be nothing left but for the whole profession to shut up shop.

Similarly, key themes often associated with entrepreneurship, such as process, uncertainty in its Knightian sense, ignorance, ambiguity, changing preferences, complexity, etc., are difficult to reconcile with the established economic theories of the firm. If these themes are taken to be the *sine qua non* of a theory of entrepreneurship, dialogue between entrepreneurship and these theories would indeed seem difficult.

However, one can offer more pragmatic critiques of the static approach of the contemporary theory of the firm that do not imply a fundamental rejection of the theory itself. Agency theory, for example, has generated important insights on the effects of incentives on effort and the relationship between incentive pay and risk that are highly relevant, for example, to understanding entrepreneurial activity within a firm (Jones and Butler, 1992). In explaining how a principal gets an agent to do something, however, the theory overlooks the more fundamental question of *what* the principal should want the agent to do, or indeed, how the principal got to be a principal in the first place. But it may be possible to tell a simple

economics-based story about how and why the principal ended up as principal rather than agent. In fact, we shall tell such a story (Chapter 8). Likewise, one could accept the basic Coasean explanation for firm boundaries (based on minimization of transaction cost) while adding behavioral, experimental, or cognitive elements to broaden the scope and applicability of the theory. We seek to do this as well (Chapters 4 and 6).

While our arguments are offered in the form of verbal theorizing, rather than the mathematical model-building that has become the norm in cutting-edge work on the firm, we think these arguments advance the theory of the firm in various ways. For example, we link the existence of the firm to the cost of trading entrepreneurial judgment. We argue that the understanding of the boundaries of the firm need to be at least partly understood as involving commercial experimentation with resource combinations that grow from the entrepreneur's judgment. And we cast light on internal organization issues by examining how entrepreneur-managers can delegate entrepreneurial initiative to lower echelons in the firm. Of course, the value and scope of these contributions is left to the reader to decide.

### *The broader management context*

Our approach also has implications for firm strategy, particularly in the context of the resource-based approach to the firm. In our perspective entrepreneurship is not simply another resource, like physical and financial capital, reputation, human capital, technical know-how, and the like, but a higher-level, coordinating factor – the source of what we shall later call “primary” or “original” judgment. Strategy research focuses on firm heterogeneity and on outliers, not representative firms. It also focuses on firm-specific coordinating capabilities (e.g., Kogut and Zander, 1992; Denrell, Fang, and Winter, 2003). Our approach suggests that the basic explanation for systematic differences in firm-level performance is that entrepreneurs differ in their abilities to exercise original judgment and to delegate “derived judgment” to subordinates. Here our approach complements the conventional resource-based literature, which focuses on the returns to individual factors but neglects the returns to the firm, that is, the idiosyncratic combinations of factors selected by particular entrepreneurs (see also Foss *et al.*, 2008). The ability to organize resources is itself

a capability, an ability to create and recognize strategic opportunities in the language of Denrell *et al.* (2003).

For example, while firms may “empower” employees partly because employees increasingly demand a certain level of autonomy, and partly because leaving decision rights with better-informed employees may make much economic sense (Jensen and Meckling, 1992), empowerment, delegation, etc. also aim to stimulate initiative in a way that is best called “entrepreneurial.” Such localized entrepreneurial efforts may contribute to the many process improvements that together add up to the “learning curve” phenomenon (Zangwill and Kantor, 1998), may lead to interaction with outside parties (customer, supplies, universities, etc.) who control potentially important knowledge (Foss, Laursen, and Pedersen, 2011), can assist in product improvements, and may in some cases lead to important breakthrough innovations. Thus, the exercise of entrepreneurship inside corporate hierarchies can have important implications for organizational performance.

### **An overview of our narrative**

As we bring entrepreneurship and the theory of the firm together, we need to demonstrate to scholars in both fields the potential gains from trade. A main part of our narrative is to establish the potential for such gains and discuss whether they have not yet been recognized and seized. We hope to establish the existence of gains by example, that is, by showing concretely how both the field of entrepreneurship and the theory of the firm stand to gain from cross-fertilization.

### *Some unfortunate historical legacies*

Why have these gains not already been recognized and seized? The most obvious reason is that economics, and with it the economic theory of the firm, developed throughout the twentieth century in a particular way, a way that effectively excluded a concern with the entrepreneur. The economic theory of the firm emerged and took shape as the entrepreneur was being banished from microeconomic analysis, first in the 1930s when the firm was subsumed into neoclassical price theory (O’Brien, 1984), and then in the 1980s as the theory of the firm was reformulated in the language of game theory and the economics of information (e.g., Holmström, 1979; Grossman and

Hart, 1986). The gradual “hardening” of the neoclassical approach in economics, including the mainstream approach to the theory of the firm, left little room for the entrepreneurship; Baumol (1994: 17) calls it “the specter which haunts economic models.” Indeed, the terms “entrepreneur” and “entrepreneurship” do not even appear in the indexes of leading texts on the economics of organization and management such as Brickley, Smith, and Zimmerman (2008) or Besanko *et al.* (2010).<sup>11</sup> We discuss this in greater detail in Chapter 2.

Entrepreneurship research is also responsible for this state of affairs. Thus, many entrepreneurship scholars have implicitly or explicitly dissociated entrepreneurship and the firm. The entrepreneurial act is often conceived as an independent, free-floating cognitive act, divorced from subsequent processes of exploiting the entrepreneurial insight by assembling resources and producing goods and services. This comes through in the literature on the personal, psychological characteristics of individuals who start new businesses. It is common, particularly within the management literature, to associate entrepreneurship with boldness, daring, imagination, or creativity (Begley and Boyd, 1987; Chandler and Jansen, 1992; Aldrich and Wiedenmayer, 1993; Hood and Young, 1993; Lumpkin and Dess, 1996). Entrepreneurship, in this conception, is not a necessary component of all human decision-making, as argued by Knight (1921) and Mises (1949), but a specialized activity that some individuals are particularly well-equipped to perform. If these characteristics are the essence of entrepreneurship, then entrepreneurship has no obvious link to the theory of the firm; the relevant personal characteristics can presumably be acquired by contract on the market by purchasing consulting services, project management, and the like. In other words, the locus of entrepreneurship fundamentally doesn’t matter.

Schumpeter’s legacy has also played an unfortunate role in separating the theory of entrepreneurship from the theory of economic organization. Schumpeter is without any doubt the best-known economics contributor to the entrepreneurship field. He is certainly *the* entrepreneurship scholar that non-specialist economists or management

<sup>11</sup> Two British surveys of economics principles textbooks (Kent, 1989; Kent and Rushing, 1999) confirm a similar absence of the concept. A review of graduate textbooks used in Sweden (largely the same books used in the US and elsewhere [Johansson, 2004]) confirms the absence of the concept of the entrepreneur.

scholars are likely to associate with the field (e.g., Nordhaus, 2004). However, Schumpeter not only explicitly dissociated the firm and the entrepreneur; he also cast the latter in heroic terms as an almost genial *Gründer*, so that entrepreneurship tended to become an exceptional occurrence of massive importance; the entrepreneur is a person who by introducing “new combinations” – new products, production methods, markets, sources of supply, or industrial combinations – shakes the economy out of its previous equilibrium, starting a process Schumpeter termed “creative destruction.”<sup>12</sup>

However, as we shall argue, entrepreneurship is very often something much more mundane, and, moreover, something that is closely tied to firm organization. In contrast, Schumpeter’s entrepreneur need not own capital, or even work within the confines of a business firm at all. This suggests a rather tenuous relationship between the entrepreneur and the firm he owns, works for, or contracts with. Moreover, because Schumpeterian entrepreneurship is *sui generis*, independent of its environment, the nature and structure of the firm does not affect the level of entrepreneurship.

### *Concepts of entrepreneurship*

The disconnect between entrepreneurship and the firm is also present in the notion of entrepreneurship as alertness to profit opportunities, a notion usually associated with the work of Israel Kirzner (1973, 1979a, 1992), which is probably only overshadowed by Schumpeter’s in terms of its impact on social science research. In particular, Kirzner’s work has become increasingly prominent in management work on entrepreneurship, directly inspiring the tendency in the field to move away from a conception of entrepreneurship as centered on small-business management to a conception of entrepreneurship as a general phenomenon, centering on opportunity discovery (Shane and Venkataraman, 2000; Shane, 2003).

As we discuss in greater detail below, there is something paradoxical about the fascination of management scholars with Kirzner’s

<sup>12</sup> Schumpeter’s thought evolved throughout his long career, however, and in later writings (e.g., Schumpeter, 1942), he adopted a more depersonalized, functional notion of entrepreneurial innovation. See, for discussion, Becker and Knudsen (2003).

work, for Kirzner's entrepreneurs do not own capital, they need only be alert to profit opportunities. Because they own no assets, they bear no uncertainty. For this reason, the link between Kirznerian entrepreneurship and the theory of the firm is weak. Owners, managers, employees, and independent contractors can all be alert to new profit opportunities; Kirzner's entrepreneur does not need a firm to exercise his function in the economy. Kirzner is not interested in the antecedents of entrepreneurship other than profit opportunities; in fact, Kirzner is not interested in entrepreneurship for its own sake, but only as an equilibrating force. His is a purely functional concept. In contrast, the entrepreneurship literature in management tends to paint a much less anonymous portrait of the entrepreneurship and to explicitly associate entrepreneurship with firms. We discuss Kirzner's views in detail in Chapter 3.

Other notions of entrepreneurship (e.g., charismatic leadership, Witt, 1998a, 1998b) are also largely disconnected from the issue of the locus of entrepreneurship. We provide a fuller discussion of these issues in Chapter 2. For now, we note only that the sole exception in the entrepreneurship literature is the notion of entrepreneurship as *judgment*, a notion put forward in the first economics contribution to entrepreneurship, Cantillon's *Essai sur la nature de commerce en général* (1755). While the view of entrepreneurship as judgment appears in many writers, it is most often associated with Frank Knight (1921), but can also be found in Mises (1949) (and, to a lesser extent, Mises' predecessors, such as Menger [1871]).<sup>13</sup> For Knight, firm organization, profit, and the entrepreneur are closely related. In his view, these arise as an embodiment, a result, and a cause, respectively, of commercial experimentation (Demsetz, 1988b).

As signaled already, much of what we are up to in this work may be seen as a reinterpretation, restatement, refinement, and updating of Knight's vision. Schumpeter's work has inspired a host of evolutionary economists, business historians, writers on technology strategy, and so on. Kirzner's work has been of great importance to management research on entrepreneurship. It is high time to restore Knight's fundamental work to the level where it belongs. In Chapters 3 and 4

<sup>13</sup> See Martin (1979) on the connection between Menger's and Knight's theories of entrepreneurship.

we discuss the specifically Knightian vision, adding more detail to, for example, his notion of judgment than Knight himself did.

The perhaps more subtle reason for the disconnect between the two fields lies in a conceptualization of entrepreneurship – dominant in the economics as well as in the management literature – in which the identification or imagination of profit opportunities is separated from the process of exploiting or realizing such opportunities. In fact, many contributors to the entrepreneurship literature put all the emphasis on the discovery of opportunities and suppress the exploitation aspects, neglecting the assembling of resources, learning about resource attributes, putting conjectures about resources to the test, etc. The process of resource deployment to seize opportunities is implicitly treated as the domain of established theories in strategy, organizational behavior, the economics of organization, etc. rather than something that belongs to the entrepreneurship field. Thus, Kirzner (1973, 1979a, 1985) thinks of entrepreneurial discovery as simultaneously discovering and seizing an opportunity. This may well fit Kirzner's paradigm example – the discovery of a dollar bill lying on the sidewalk – and it may be an innocuous assumption in the context of the purpose of Kirzner's theory of entrepreneurship: to explain the equilibrating market process. However, in general it misconstrues the nature of entrepreneurship, and disconnects entrepreneurship from the firm.

Likewise, management theories of economic organization and strategy, while paying substantial attention to the cognitive aspects of the discovery process (Lumpkin and Dess, 1996; Shane, 2003), tend to treat opportunities as *given* once the process of resource assembly begins.<sup>14</sup> In other words, established approaches both in entrepreneurship theory and in management treat opportunity discovery as a discrete event separating two distinct stages of the value creation process, giving rise to a separation into two sets of literatures, one on the processes by which plans are made, opportunities are perceived and evaluated, etc., and another in which plans, once formulated, are executed through the deployment of resources.

We argue that the separation of the value creation process into clearly delineated discovery, evaluation, and exploitation phases

<sup>14</sup> An important exception is Sarasvathy (2003).

without feedback loops is artificial and misleading.<sup>15</sup> In our perspective, opportunities for entrepreneurial gain do not exist, objectively, waiting to be discovered and exploited; rather, opportunities come into existence only as they are manifested in action. Of course, objective *indications* of an opportunity may exist, such as consumer research that reveals that consumers may demand certain not yet existing functionalities in certain products. However, such indicators do not automatically translate into opportunities, for two reasons. First, the objective indicators require *interpretation*; survey results may be objective data, but the knowledge embodied therein contains an essential subjective element (Foss *et al.*, 2008). Second, unmet market demands, once perceived, do not become opportunities without substantial commitment of resources on the part of the entrepreneur, including his own work. In other words, opportunities are largely created through forward-looking entrepreneurial action.

### *Organizing the entrepreneurial process*

This is essentially the concept of entrepreneurship as judgmental decision-making under uncertainty, a concept we trace through Cantillon (1755), Say (1803), Knight (1921), and Mises (1949). In this approach entrepreneurs are modeled as decision-makers who invest resources based on their judgment of future market conditions, investments that may or may not yield positive return. Because markets for judgment are closed, the exercise of judgment requires starting a firm; moreover, judgment implies asset ownership. In Knight's formulation, entrepreneurship represents judgment that cannot be assessed in terms of its marginal product and which cannot, accordingly, be paid a wage (Knight 1921: 311). In other words, there is no market for the judgment that entrepreneurs rely on, and therefore exercising judgment requires the person with judgment to own productive assets. Of course, judgmental decision-makers can hire consultants, forecasters, technical experts, and so on. However, in doing so they are exercising their own entrepreneurial judgment. Judgment thus implies asset

<sup>15</sup> Note the parallel to Rosenberg's (1982) critique of the "linear" model in innovation studies.



ownership, for judgmental decision-making is ultimately decision-making about the employment of resources.<sup>16</sup>

We show how the notion of entrepreneurship as judgment illuminates these issues in novel ways. To develop a judgment-based approach to the firm, we also draw on ideas from Austrian economics (Mises, 1949; Rothbard, 1962; Kirzner, 1973) – the body of economics that is perhaps most intimately connected to ideas on entrepreneurship – and on property-rights economics (Hart, 1995; Barzel, 1997), an important part of modern organizational economics. In our approach, resource uses are not *data*, but are *created* as entrepreneurs envision new ways of using assets to produce goods. The entrepreneur’s decision problem is aggravated by the fact that capital assets are *heterogeneous*, and it is not immediately obvious how they should be combined.

The entrepreneur’s role, then, is to arrange or organize the capital goods he owns, as we explain in Chapter 5. In the words of Ludwig Lachmann (1956: 16), a key contributor to the Austrian theory of capital: “We are living in a world of unexpected change; hence capital combinations ... will be ever changing, will be dissolved and reformed. In this activity, we find the real function of the entrepreneur.” Austrian capital theory provides a unique foundation for an entrepreneurial theory of economic organization. Neoclassical production theory, with its notion of capital as a permanent, homogeneous fund of value, rather than a discrete stock of heterogeneous capital goods, is of little help here.<sup>17</sup> Transaction-cost, resource-based, and property-rights approaches to the firm do incorporate notions of heterogeneous assets, but they tend to invoke the needed specificities in an ad hoc fashion to rationalize particular trading problems – for transaction-cost economics, asset specificity; for capabilities theories, tacit knowledge; and so on. The Austrian approach, starting with Menger’s (1871) concepts of higher- and lower-order goods and extending through Böhm-Bawerk’s (1884–1912) notion of roundaboutness, Lachmann’s (1956) theory of multiple specificities, and Kirzner’s (1966) formulation of capital structure in terms of subjective

<sup>16</sup> Note that we define the firm here in terms of resource ownership, not the employment relation. A firm, in this sense, can consist of an individual resource owner – a craftsman who owns his own tools is a firm, while an identical craftsman who works with someone else’s tools is an employee.

<sup>17</sup> Ironically, the notion of capital as a homogeneous fund owes its popularity to Knight (1936).

entrepreneurial plans, offers a solid foundation for a judgment-based theory of entrepreneurial action.

One way to operationalize the Austrian notion of heterogeneity is to incorporate Barzel's (1997) idea that capital goods are distinguished by their *attributes*. Attributes are characteristics, functions, or possible uses of assets, as perceived by an entrepreneur. Assets are heterogeneous to the extent that they have different, and different levels of, valued attributes. Attributes may also vary over time, even for a particular asset. Given Knightian uncertainty, entrepreneurs are unlikely to know all relevant attributes of all assets when production decisions are made. Nor can the future attributes of an asset, as it is used in production, be forecast with certainty.

### *Ownership, the boundaries of the firm, and internal organization*

Entrepreneurs who seek to create or discover new attributes of capital assets will want ownership titles to the relevant assets, both for speculative reasons and for reasons of economizing on transaction costs. These arguments provide room for entrepreneurship that goes beyond deploying a superior combination of capital assets with "given" attributes, acquiring the relevant assets, and deploying these to producing for a market. Entrepreneurship may also be a matter of *experimenting* with capital assets in an attempt to discover new valued attributes.

Such experimental activity may take place in the context of trying out new combinations through the acquisition of or merger with another firm, or in the form of trying out new combinations of assets already under the control of the entrepreneur. The entrepreneur's success in experimenting with assets in this manner depends not only on his ability to anticipate future prices and market conditions, but also on internal and external transaction costs, the entrepreneur's control over the relevant assets, how much of the expected return from experimental activity he can hope to appropriate, and so on. These aspects of our theory are covered in chapters 6, 7 and 8.

## 4 | *What is judgment?*

As we argued in the previous chapter, the key construct that links entrepreneurship and the theory of the firm is *entrepreneurial judgment*. But what is judgment, exactly? So far we have treated judgment in a highly formal and abstract way, as *that which generates profit and loss*. Here we are consistent with other approaches to the entrepreneurial function: Schumpeter takes entrepreneurship to be *that which generates economic growth*, while Kirzner treats it as *that which causes markets to equilibrate*. In all of these cases, entrepreneurship itself is largely a black box; it is invoked, instrumentally, to explain a particular set of phenomena.

Judgment, to be more specific, is residual, controlling decision-making about resources deployed to achieve some objectives; it is manifest in the actions of individual entrepreneurs; and it cannot be bought and sold on the market, such that its exercise requires the entrepreneur to own and control a firm. To simplify, we have collapsed into this notion the acts of creating and evaluating opportunities, and deciding on which resources need to be assembled, how they need to be combined, etc. to realize the opportunity.<sup>1</sup> We have made the point that judgment is a meaningful notion of decision-making that is intermediate between decision-making via formalizable rules and pure luck or random behaviour (see Casson, 1982). It is the kind of decision-making that concerns unique business investments for which it is difficult, or even impossible, to assign meaningful probabilities to outcomes, or even to specify the set of possible outcomes itself (Shackle, 1972; Zeckhauser, 2006). When confronted with such a situation, individuals will reach different decisions, even

<sup>1</sup> Langlois (2007a) argues that one can consider Kirzner's work about the discovery of opportunities, Schumpeter's (1911) about the exploitation of opportunities, and Knight's (1921) about the evaluation of opportunities. However, Knight's use of the notion of judgment would seem to also involve discovery (or creation) and exploitation.

if they share the same objectives and the data are presented to them in exactly the same manner, because they have access to different information, interpret the data in different ways, and so on (Lachmann, 1977; Casson and Wadeson, 2007). In Bayesian terms, priors are diffuse, and updating rules may differ.

For explaining the existence of the firm, such a highly abstract treatment may be perfectly fine. However, in later chapters we apply the notion of judgment more broadly, examining teams as *loci* of judgment, and arguing that judgment can, in an important sense, be delegated. We also explore how judgment helps explain the boundaries and internal organization of firms. Examining these issues requires us to be more explicit about the nature of entrepreneurial judgment. Similarly, to tease out policy and management implications of the judgment theory of the firm, we need to begin opening up the black box of judgment. Finally, it may also be useful to break down the act of entrepreneurial judgment into distinct imagination or discovery, evaluation, and exploitation phases of entrepreneurial action. Not only may these activities be temporally separated, they may also reside with different actors. Thus, since Schumpeter (1942) much work in innovation studies and corporate strategy has proceeded from the assumption that the large industrial firm is characterized by an “entrepreneurial division of labor,” different entrepreneurial activities residing in different parts of the firm. The different activities that underlie this division of labor are underpinned by different skills and may represent different aspects of judgment.

Economists have usually discussed judgment in a specific epistemic context, namely that of “uncertainty,” sometimes called “Knightian uncertainty” as homage to the first economist to discuss it systematically (Knight, 1921). Uncertainty is one of the most fascinating and perplexing concepts in economics, one that has also recently been picked up by management scholars in the entrepreneurship field (e.g., McMullen and Shepherd, 2006). We provide a brief account of its history as well as of its modern treatments. Following Knight we then link judgment to uncertainty, treating judgment as the exercise of a particular skill, namely that of dealing successfully with resource allocation decisions under uncertainty.

Certain entrepreneurs and investors – Warren Buffet comes to mind (Buffett and Clark, 1997) – seem to have a persistent, successful track record in making such decisions. One explanation for repeated

entrepreneurial success, suggested by Alchian (1950) and Taleb (2007) (drawing on a famous thought experiment about coin-flipping by Emile Bor el), is that this reflects persistent luck. This hypothesis is rooted in the idea that Knightian uncertainty is fundamentally debilitating, epistemologically, and hence might as well be randomness. Many economists hold this view. Schultz (1980: 437–438), for example, insists that “it is not sufficient to treat entrepreneurs solely as economic agents who only collect windfalls and bear losses that are unanticipated. If this is all they do, the much vaunted free enterprise system merely distributes in some unspecified manner the windfalls and losses that come as surprises.” In other words, the future is either “anticipated,” by which Schultz means “describable using expected utility theory,” or pure surprise – that is, luck.

Knight (1921: 298), however, clearly thought that some people systematically deal with uncertainty better than others: “Like a large portion of the practical problems of business life, as of all life, this one of selecting human capacities for dealing with unforeseeable situations involves paradox and apparent theoretical impossibility of solution. But like a host of impossible things in life, it is constantly being done.” Mises (1949: 585) likewise attributes to the entrepreneur a

specific anticipative understanding of the conditions of the uncertain future [that] defies any rules and systematization. It can be neither taught nor learned. If it were different, everybody could embark upon entrepreneurship with the same prospect of success. What distinguishes the successful entrepreneur and promoter from other people is precisely the fact that he does not let himself be guided by what was and is, but arranges his affairs on the ground of his opinion about the future. He sees the past and the present as other people do; but he judges the future in a different way.

How, exactly, does the entrepreneur “judge the future in a different way”? Is this something that can be analyzed systematically, by decision-makers themselves or by analysts? Or do we conclude, like Lucas (1986), that economics cannot handle Knightian uncertainty?

While traditional decision theory offers little on dealing with Knightian uncertainty, this does not leave decision-makers in epistemological bedlam. We argue that entrepreneurs can deal with uncertainty, and hypothesize that judgment is rooted in *skills* for handling

uncertainty, an idea that was key to Knight's thought. Thus, while the exercise of judgment is a function (or, rather, a set of complementary functions), it is based on perceptions, skills, and heuristics. The link between those perceptions, skills, and heuristics, and the judgment they inform is not deterministic, of course; if it were, we would not be talking about judgment, but decision-making according to formal rules. As Phelps (2006: 5) puts it, citing Hayek, "actors in the world have to make judgments that are not fully implied by their formal models." And yet, as we shall see, we can peek somewhat into the black box of judgment.

Note that in suggesting a possible "operationalization" of judgment, we do not deny that the purely formal, logical notion of uncertainty-bearing, as the economic function uniquely responsible for economic profit and loss, is valid and useful. Indeed, the emergence of a correct theory of profit – not a standardized, automatic rate of return on invested capital (as in Ricardo), a "surplus" extracted from labor value (as in Marx), or a monopoly rent (as in Marshall), but a reward from successful bearing of uninsurable risks – was one of the most important developments in twentieth-century economics. From a managerial point of view, however, this strictly formal notion does not offer much insight or guidance. Here we suggest ways the formal idea of judgment can be extended, augmented, and applied, to build a theory of entrepreneurial organization with richer implications and applications.

### **Knightian uncertainty**

[T]he truth is, there are things we know, and we know we know them – the known knows. There are things we know that we don't know – the known unknowns. And there are unknown unknowns; the things we do not yet know that we do not know. Donald Rumsfeld

Former Defense Secretary Rumsfeld may not exactly be a bona fide epistemologist, but in the above quotation – ridiculed by commentators at the time it was uttered – he encapsulated some basic insights that go right to the heart of the fundamental issues in the nexus of entrepreneurship: risk/uncertainty/ignorance, and decision-making, and the social organization of these. Thus, when Kirzner (1979a: 181) points out that "entrepreneurship reveals to the market what the market did

not realize was available, or indeed, needed at all,” he is pointing to the importance of handling the third Rumsfeldian unknown. Hayek’s (1945, 1973) social thought, on which Kirzner builds, is all about how evolved institutions deal with the unknown unknowns. Actually, Rumsfeld’s three unknowns correspond nicely to the way Knight constructs his key argument on probability in *Risk, Uncertainty, and Profit* (1921), as we shall see. (Like Hayek, Knight also consistently related his social thought to these epistemic problems.)

### *Knight on uncertainty*

As indicated earlier the judgment theory of entrepreneurship ultimately derives from Cantillon who, in Hébert and Link’s (1988: 21) description, defined the entrepreneur as “someone who engages in exchanges for profit; specifically, he or she is someone who exercises business judgment in the face of uncertainty.” Others, notably, Mises (1949), have cultivated similar views. However, the *locus classicus* of the judgment view of entrepreneurship remains Frank Knight’s *Risk, Uncertainty, and Profit* (Knight, 1921).

***Interpretations of Knight’s work.*** For several decades Knight’s book has generated a growing interpretive literature (e.g., Barzel, 1987; LeRoy and Singell, 1987; Boudreaux and Holcombe, 1989; Langlois and Cosgel, 1993; Foss, 1993b; Demsetz, 1988b; Runde, 1998; Emmett, 1999, 2009, 2010; Brooke, 2010). This literature is akin to the literature on “what Keynes really meant” (e.g., Coddington, 1983) in striking ways. Thus, some scholars interpret Knight as making a break with existing economics based on a radical epistemology stressing the unknowability of the future (e.g., Boudreaux and Holcombe, 1989; Langlois and Csonotos, 1993) while others, armed with subjective probability theory and the economics of information, argue that Knight’s theory of profit and the firm is entirely consistent with mainstream economics. For example, there is an argument that Knight was simply invoking “risk” and “uncertainty” as labels for risk that can be insured versus risk that cannot (LeRoy and Singell, 1987; Demsetz, 1988b). In this interpretation, Knight was talking about commercial experimentation, the basis of which is so much inside the head of the entrepreneur that it cannot be meaningfully assessed by the market in terms of probabilities (although the entrepreneur himself may be capable of doing so).

Barzel (1987) interprets Knight's theory of the emergence of the entrepreneurial firm in terms of a standard agency problem: The entrepreneur should assume the roles of manager and residual claimant because his marginal product is the hardest among the complementary inputs to measure. Similarly, LeRoy and Singell (1987) see Knight's main contribution as anticipating the notion of asymmetric information. Kihlstrom and Laffont (1979) reconstruct Knight's theory entirely in terms of differential risk preferences, taking Knight's discussion of firm organization to mean that the "confident and venturesome 'assume the risk' or 'insure' the doubtful and timid" by guaranteeing them a fixed wage (Knight, 1921: 269).

There is considerable textual basis in Knight (1921) for all of the above interpretations. But we agree with Boudreaux and Holcombe (1989) and Langlois and Cosgel (1993) that what LeRoy and Singell (1987: 402) dismiss as "Knight's extended Austrian-style disquisitions on the foundations of human knowledge and conduct and the like" are quite central to Knight's message.<sup>2</sup> They provide the deep foundations for his insistence that what matters for the understanding of probability is the mind's classification of events (i.e., the extent to which events can be meaningfully placed in well-defined, non-trivial categories). Knight's ideas on cognition supply an argument for why many events are truly unique. And they explain why (to use modern terminology) many forward markets are closed, meaning that there are few intertemporal prices that support intertemporal resource allocation, and why judgment in the form of commercial experimentation is therefore necessary.

<sup>2</sup> The full passage from LeRoy and Singell (1987: 402) reads as follows: "Even the reader who skips Knight's extended Austrian-style disquisitions on the foundations of human knowledge and conduct and the like – and surely this must include almost all readers – will at times despair of extracting any core of original insight from the overripe fruit of Knight's prose." We are not sure we would take the writing style of the typical neoclassical economist over Knight's, however. Consider this: "The first fact to be recorded is that [economic] reality exists or 'is there.' This fact cannot be proved or argued or 'tested.' If anyone denies that men have interests or that 'we' have a considerable amount of knowledge about them, economics and its entire works will simply be to such a person what the world of color is to the blind man. But there would still be one difference: a man who is physically, ocularly blind may still be rated of normal intelligence and in his right mind." (Knight, 1940: 12).



***Knight on probability.*** Knight's (1921) fundamental contribution is conventionally seen as the risk/uncertainty distinction. However, this particular distinction is only invoked in passing (1921: 21, 233). His fundamental argument, developed in chapter 7 of Knight (1921), involves a tripartite classification of the notion of probability into "*a priori* probability," "statistical probability," and "estimated probability." Situations that can be described epistemically in terms of the two first categories represent risk, while the third condition describes situations involving uncertainty. Thus, "*a priori* probability" refers to situations where probabilities can be ascertained in a purely deductive manner (e.g., the probabilities of either side of a fair coin) and where possible outcomes are entirely well-defined (in Knight's [1921: 224] words, there is an "absolutely homogeneous classification of instances"). In contrast, under "statistical probability" the outcomes are not based on homogeneous (and equally probable) instances. Statistical probability is obtained by identifying and classifying experiential instances (events), lumping heterogeneous together in preselected categories, tabulating the frequencies for the purpose of calculating probability, akin to the frequentist probability interpretation of (Richard) von Mises (1939).<sup>3</sup>

Finally, estimated probability refers to situations where there is "no valid basis of any kind of classifying instances" (Knight, 1921: 225). As Langlois and Cosgel (1993: 459) note: "uncertainty as Knight understood it arises from the impossibility of exhaustive classification of states." In this situation, we are forced to make a "judgment of probability," even though we may be fully aware that our estimate of the set of probable outcomes likely differs from the set of possible outcomes (Jarvis, 2010: 28), and the relevant estimated probabilities are likely to be highly imprecise. This is simply the order that a rational mind seeks to impose on a less orderly universe, and is entirely consistent with man's rational nature.

It is easy to understand why subjective probability theorists (e.g., LeRoy and Singell, 1987) have thought of Knight as a natural ally, indeed precursor. Savage's (1954) derivation of expected utility theory

<sup>3</sup> Of course, this also means that there are degrees of statistical probability, depending on how homogenous instances are (Runde, 1998). A priori probability may be seen as one limit of statistical probability (as instances are entirely homogenous) and "estimated probability" as the other limit (instances are highly heterogeneous).

without imposing any objective probabilities may appear close in spirit to Knight's thinking on estimated probability.<sup>4</sup> Indeed, we think Knight clearly accepted the idea of subjective probability, and that he did not claim that it is meaningless to try to assign probabilities to outcomes under uncertainty.<sup>5</sup> However, we also agree with Langlois and Cosgel (1993: 460) that the key to Knight's thought here is the extent to which "categories" can be "estimated" and shared between individuals (rather than the calculation of probabilities). As Langlois and Cosgel (1993: 460) put it: "When the categories of knowledge themselves are unknown, they cannot form the basis of interpersonal agreement and market exchange." Knightian uncertainty is thus primarily about *the ability to articulate and communicate, or transfer, estimates about the future*, rather than the ability of individuals to make these estimates themselves – just as the Hayekian notion of specific knowledge can be described in terms of the ability to transfer information from one person to another (Jensen and Meckling, 1992).

This is the situation of Rumsfeldian unknown unknowns, where judgment becomes the act of resource allocation by an entrepreneur who holds knowledge categories that differ from everyone else's – in other words, entrepreneurs establish firms not because they have no knowledge of the future, but because their beliefs about the future cannot be easily articulated and communicated to existing resource owners. As Casson (1982: 14) notes, "[t]he entrepreneur believes he is right, while everyone else is wrong. Thus, the essence of entrepreneurship is being different – being different because one has a different perception of the situation."

More surprising than the association of Knight with subjective probability theory is the lumping of Knight with Keynes as like-minded proponents of "genuine," "radical," or "deep" uncertainty (e.g., Bewley, 1989: 2). While Keynes invoked uncertainty in the context of

<sup>4</sup> This may also suggest the perhaps rather far-fetched suggestion that the Debreu (1959) state-preference approach, in which there are no assignments of probabilities at all, is consistent with Knight's notion of estimated probability or uncertainty.

<sup>5</sup> Richard von Mises (1939: 76), however, held exactly that view: "The peculiar approach of the subjectivists lies in the fact that they consider 'I presume that these cases are equally probable' to be equivalent to 'These cases are equally probable,' since, for them, probability is only a subjective notion."

unique, rare (investor) situations<sup>6</sup> – perhaps the black swans of Taleb (2007) – Knight saw uncertainty as characterizing many, reasonably mundane decisions. To illustrate he asked, “what is the ‘probability’ of error ... in the judgment” of a manufacturer deciding to expand production? The response (Knight, 1921: 226) is that it is

manifestly meaningless to speak of either calculating a probability a priori or of determining it empirically by studying a large number of instances ... [T]he “instance” in question is so entirely unique that there are no others or not a sufficient number to make it possible to tabulate enough like it to form a basis for any inference of value about any real probability in the case we are interested in. The same obviously applies to ... most conduct and not business alone.

However, this does not mean that there are no rational grounds for forming beliefs and making decisions.

### *Kindred spirits: Mises, Shackle, Lachmann*

**Mises.** As noted already, Knight’s thinking on probability harmonizes in some key ways with Mises’ (1949) thinking on the matter.<sup>7</sup> Mises does not use Knight’s terminology, but distinguishes similarly between “class probability” and “case probability.” The former describes situations in which an event may be classified as a unique element of a homogeneous class, the properties of which are known. No one can predict whether a particular house in a particular neighborhood will burn down in a given year, but insurance companies know how many similar houses in similar locations have burned in the past, and from this the likelihood of a particular house burning within a particular

<sup>6</sup> “By ‘uncertain’ knowledge, let me explain, I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty ... The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence ... About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know” (Keynes, 1937: 213–214).

<sup>7</sup> See Hoppe (2007) for a comparison of Mises’ and Knight’s views on probability. There is no evidence that Mises was directly influenced by Knight (1921), but Knight visited Mises’ University of Vienna seminar in 1930 (Hülsmann, 2007: 764) and Mises was surely familiar with Knight’s work.

period can be estimated. Case probability, by contrast, applies to cases in which each event is unique, such that no general class probabilities can be defined.<sup>8</sup>

Mises builds here on the influential work of his brother Richard von Mises (1939), a developer of the “frequentist” approach to probability. Frequentism defines the probability of a particular event as the limit value of its relative frequency in a series of trials. In this understanding, probabilities can be defined only in cases in which repeated trials are feasible – that is, in situations where each event can be meaningfully compared to other events in the same class. Moreover, and for this reason, probabilities can only be defined *ex post*, as learned through experience, and cannot exist a priori. Hence Mises defines case probability, or uncertainty, as a case in which probabilities, in the frequentist sense, do not exist.<sup>9</sup> This is quite close to Knight’s distinction between “statistical probability” and “estimated probability.”

However, Mises goes farther than Knight: For Mises, purposeful human behavior *in general* cannot be considered part of a homogeneous class, and therefore only case probability applies to economic outcomes (Knight did not make this claim). Of course, as Hoppe (2007) notes, we can define such classes in a technical sense – us writing this chapter is an element of the class “entrepreneurship scholars writing book chapters” – but defining the class is not sufficient for applying class probability to an event. There must also be randomness, or what Richard von Mises (1939: 24) calls “complete lawlessness,” within the class. And yet, argues Hoppe (2007: 11), this is not possible with human action:

It is in connection with this randomness requirement where Ludwig von Mises (and presumably Knight) see insuperable difficulties in applying probability theory to human actions. True, formal-logically for every single

<sup>8</sup> O’Driscoll and Rizzo (1985) adopt the terms “typical events” and “unique events” to get at this distinction.

<sup>9</sup> Hence the use of the term “case probability,” like Knight’s term “judgment of probability,” is misleading; what Mises really means is “case non-probability,” or perhaps “case judgments without probabilities.” Confusingly, Mises (1949: 107) also argues elsewhere that “[o]nly preoccupation with the mathematical treatment could result in the prejudice that probability always means frequency.” Van den Hauwe (2007) argues, in contrast, that Mises’ position is in some ways closer to Keynes’.

action a corresponding collective can be defined. However, ontologically human actions (whether of individuals or groups) cannot be grouped in “true” collectives but must be conceived as unique events. Why? As Ludwig von Mises would presumably reply, the assumption that one knows nothing about any particular event except its membership in a known class is false in the case of human actions; or, as Richard von Mises would put it, in the case of human actions we know a “selection rule” the application of which leads to fundamental changes regarding the relative frequency (likelihood) of the attribute in question (thus ruling out the use of the probability calculus).

Of course, painting Mises as a frequentist, rather than subjectivist, may appear odd given the importance of subjectivism more generally in Austrian economics. As is well-known, Austrians emphasize subjectivity not only of value – an emphasis shared by neoclassical economists – but also subjectivism of knowledge and even expectations (Foss *et al.*, 2008). Langlois (1982), in this vein, argues that probabilities should be interpreted as beliefs about information structures, rather than objective events. “[I]t is not meaningful to talk about ‘knowing’ a probability or a probability distribution. A probability assessment reflects one’s state of information about an event; it is not something ontologically separate whose value can be determined objectively” (Langlois, 1982: 8).

What distinguishes case from class probability, according to Langlois, is the character of the decision-maker’s information about the event. Objective probabilities (in the frequentist sense) are simply special cases of subjective probabilities in which the decision-maker structures the problem in terms of classes of events. Entrepreneurship, in Langlois’ interpretation, can be described as the act of formalizing the decision problem. To use the language of decision theory, a non-entrepreneur (call him, following Kirzner [1973: 32–37], a Robbinsian maximizer) is presented with a decision tree, a set of outcomes, and the probabilities for each outcome, and simply uses backwards induction to solve the problem. The entrepreneur, as it were, redraws the tree, by noticing a possible option or outcome that other agents failed to see. The key distinction, according to Langlois, is not whether the decision tree is populated with objective or subjective probabilities, but whether the tree itself is exogenous (Knightian risk) or endogenous (Knightian uncertainty).

*Shackle.* Knight (1921) made a philosophically based distinction between what he called the “ignorance theory of probability” and the “doctrine of real probability,” roughly corresponding to whether thinking on probability is based on a deterministic ontology or an indeterminist one. For Knight, this is not merely an epistemically motivated distinction. According to the doctrine of real probability the future is not only unknown, but also “unknowable” (so there are, strictly speaking, no objective probabilities regarding future events), and probability is an epistemic device for handling the resulting indeterminacy. British economist George Shackle (1972) made the unknown and unknowable characteristic of the future the key theme of his thinking on uncertainty (see also Loasby [1976] for an important contribution in this vein). However, he deliberately avoided the terminology of probability, deeming it only appropriate for situations in which the set of possible outcomes is well-defined. To Shackle, the human powers of imagination and innovation and the consequent open-endedness of the economy must imply a situation of what is essentially ignorance: A world where the nature and identity of some non-trivial future states are unknown and unknowable (Shackle, 1979). This gives rise to surprises, or what Taleb (2007) later popularized as “black swans.” Shackle even devised a formalism for handling this.<sup>10</sup> The irregular occurrence of major surprising events make the economy “kaleidic,” that is, given to major, radical changes that drastically upset the existing pattern of resource allocation.

*Lachmann.* Ludwig Lachmann (1976, 1977) embraced the importance of imagination and surprise in Shackle’s work, but added his own Austrian twist to these arguments: The fundamental reason why the future is unknown and unknowable, and that the economy is given to kaleidic disruptions, relates to the growth of knowledge. We cannot think of time in isolation from a process of the growth of personal knowledge (Lachmann, 1976); the two are inherently intertwined (see also Loasby, 1976). However, future knowledge must be unpredictable; if it weren’t, it would be present knowledge.

<sup>10</sup> Namely, his “potential surprise” framework, which, however, was argued to be essentially a subjective probability framework (Shackle, 1949, 1955). As Langlois (1986) observes, a radical Bayesian may insist that there is a category of outcomes, namely the unexpected ones, on which a probability number can be placed. The logical meaningfulness of this, as well as of Shackle’s potential surprise framework, is clearly open to debate.

In sum, following Knight's lead, a number of economists have argued that when economic change is driven by radical, unpredictable patterns in the growth of knowledge, entrepreneurs use what we call judgment to interpret economic data and anticipate, or "appraise," future market conditions. Entrepreneurship is thus seen as human action that creatively formulates and solves new problems (Mises, 1949).

### *Modern mainstream treatments*

Although Knightian uncertainty crops up most often within heterodox economics and academic management circles, some mainstream economists have dealt with it as well. Bewley (1986, 1989) constructs a "Knightian" decision theory by tweaking Bayesian methods, specifically eliminating the assumption that preferences over lotteries are complete and introducing the possibility of "new alternatives," that is, decision alternatives not present at the time the decision-maker formulates the full contingent program for the whole decision tree. In Bewley's conceptualization the entrepreneur is an agent who starts a project without knowing the precise probabilities of the outcomes of the project, emphasizing ambiguity in the assessment of probabilities.<sup>11</sup> This ambiguity is modeled by assuming that an individual uses many probabilities to evaluate a given (uncertain) outcome of a project. Due to this multiplicity of beliefs – for example, there are many net present values for a given project – situations may arise in which the decision-maker simply cannot compare any two possible outcomes (payoffs), and therefore is unable to calculate the expected utility.

Bewley's ingenious approach to modeling ambiguity (first formulated in two working papers in 1986 and 1989, but not published until 2002 and 2001, respectively) has been picked up by several scholars; Rigotti, Ryan, and Vaithianathan (2011), for example, build a model of an economy with agents who differ in their optimism. Those agents who pick probabilities from the upper part of a distribution or project outcomes are optimists and are likely to form a firm to realize the

<sup>11</sup> And the decision problem cannot be modeled as a larger game in which "nature" first chooses which set of probabilities apply, without informing the decision-maker, as in Harsanyi (1967, 1968a, 1968b).

project. They use this characterization to model “innovation-proof equilibria” in which no beneficial opportunities for innovation exist.

### **Judgment: purposeful behavior under uncertainty**

It is a world of change in which we live, and a world of uncertainty. We live only by knowing something about the future; while the problems of life, or of conduct at least, arise from the fact that we know so little.

(Knight, 1921: 199)

### *Handling uncertainty*

As we have seen, many important economists have addressed radical or “deep” uncertainty and its underlying knowledge conditions. They have conceptualized these very differently, however, and have addressed the implications of radical uncertainty for coordination and economic order in very different ways. Thus, Mises (1949, 1951) argued that all actions are essentially shrouded in uncertainty but added, anticipating Alchian (1950), that the market’s competitive sorting mechanisms based on the profit-and-loss mechanism and private ownership would successfully discriminate between entrepreneurs with varying abilities to engage in entrepreneurial “appraisal” in the presence of uncertainty (Salerno, 1993). Knight focused on uncertainty because it allowed him to explain the existence of the firm and profits; he did not necessarily deny, however, that many business decisions are entirely routine (in the sense of Cyert and March [1963] and Nelson and Winter [1982]). Based on a “fundamentalist” reading of Keynes, Shackle (1972) developed his “kaleidic” notion of the economy. Ludwig Lachmann followed suit (Lachmann, 1976). Israel Kirzner (1973, 1979a, 1985, 1997), arguably the one who departed the least from the knowledge conditions of the standard model of economics, nevertheless stressed the importance of “sheer ignorance,” going beyond the conventional notion of asymmetric information (Kirzner, 1997). These thinkers also drew very different conclusions about how agents handle uncertainty. Lachmann focused on social institutions as entities to reduce uncertainty (Lachmann, 1970; Langlois, 1986; Foss and Garzarelli, 2007). Knight regarded the entrepreneur and the firm as those mechanisms for handling



uncertainty.<sup>12</sup> Kirzner conceptualized the entrepreneur as the force that closes “pockets of ignorance” in the market, continuously pushing it towards a kind of equilibrium.

All these scholars recognized that uncertainty poses a fundamental challenge for resource allocation, and at least Mises and Lachmann appealed to higher-level institutions and mechanisms to explain how some measure of order can be maintained in the presence of uncertainty.<sup>13</sup> Both Kirzner and Knight describe the entrepreneur as a coordinating agent, though Kirzner deliberately shies away from addressing the *content* of entrepreneurial decision-making, beyond associating it with alertness to previously unnoticed profit opportunities. Indeed, given Kirzner’s refusal to associate such alertness with any opportunity costs, it is hard to describe this as “decision-making” at all. Rather, alertness seems *sui generis*, in between luck and deliberate decision-making. This comes close to Schumpeter’s view that entrepreneurship consists of “intuition, the capacity of seeing things in a way which afterwards proves to be true, even though it cannot be established at the moment and of grasping the essential fact, discarding the unessential, even though one can give no account of the principles by which this is done” (1911: 85). Essentially, Kirzner and Schumpeter’s characterization of entrepreneurship in terms of alertness and bold intuition puts it in a black box, and, in Schumpeter’s case, makes entrepreneurship distinctly extra-economic.

Knight arguably goes farther in his characterization of judgment than Kirzner does in the case of alertness and Schumpeter in the case of intuitive entrepreneurship. Unlike virtually all of the other scholars named above, he grapples directly with the psychology of uncertainty (see in particular Knight, 1921: 241–242), and maintains that

<sup>12</sup> As Emmett (2010: 17) explains, for Knight, “those who accept the moral challenge of exercising *responsible judgment* regarding the use of resources in the midst of uncertainty are entrepreneurs. The entrepreneur accepts the challenge of acting even when there is a potential for moral hazard to exist, and backs it up by hazarding his own resources (Knight 1921: 299). But the entrepreneur exercises responsible judgment in doing so. The key judgment the entrepreneur makes, Knight argued, regards his opinion of those with whom he contracts, as suppliers, workers, and clients. In an uncertain world, ‘attention and interest shift from the errors in men’s opinions of things to the errors in their opinions of men’ (Knight 1921: 292).”

<sup>13</sup> See Klein (2008b) for a discussion of the various concepts of equilibrium or coordination that appear in the Austrian literature.

individuals actively and rationally deal with uncertainty by forming (tacit) probability estimates – a different argument from appealing to “intuition,” “serendipity,” or “understanding.” Ironically, those modern scholars who examine the psychological antecedents of entrepreneurship have usually started with Kirzner, rather than Knight. However, Kirzner insists that we “cannot explain how some men discover what is around the corner before others do” (Kirzner, 1976: 121) – although he also admits that the “ability to learn without deliberate search is a gift individuals enjoy in quite different degrees” (1979a: 148).

### *Elements of judgment*

To repeat, we conceive judgment as the crucial entrepreneurial element of making uncertain decisions regarding uses of current or new resources to satisfy future preferences. As Langlois (2007c: 1113) puts it, judgment “is Knight’s term for the process of creating frameworks of interpretation and decision.” In actuality, judgment therefore is present in a host of decisions related to an entrepreneurial venture (Casson, 1982). This raises the question of whether judgment can in a sense be delegated (as Knight argued). We treat this issue in a later chapter and here provide a characterization of judgment per se.

Economists have generally shied away from theorizing directly about entrepreneurial decision-making (rather than the effects of such decision-making). The main reason is probably the traditional belief that economists per se have nothing to say about such decision-making,<sup>14</sup> or the belief that theorizing about entrepreneurial decision-making is fundamentally self-defeating or pointless as any such theory will immediately become worthless if placed in the public domain or will be privately exploited by a scientist-turned-entrepreneur. However, scholars from other fields and disciplines have been engaged in several decades in examining the constituent components of entrepreneurial decision-making. In the following we rely on some of this work in order to provide a fuller characterization of entrepreneurial

<sup>14</sup> Even the recent fascination with neuroeconomics and behavioral economics is essentially about feeding findings from other fields and disciplines into the micro foundations of economic models.

judgment. We are not claiming that a predictive theory of judgment is at hand, merely arguing that judgment may meaningfully be treated as a latent construct, and that we can point to several manifest variables that constitute this construct and which have identifiable antecedents. In the following we treat manifest variables and antecedents under the same heading.

*Skills and experience.* Entrepreneurial activities have several qualities, involving underlying skills (Casson, 1982: 25). Thus, formulating a decision problem requires specifying potential strategies for dealing with the problem, requiring imaginative skills (Gartner, 2007); deriving decision rules (even if, in the spirit of Knight, highly personal and idiosyncratic ones) requires analytical skills; collecting data requires skills at searching; and so on. Certain firms or types of firms may be particularly good at fostering these skills among their employees (Klepper, 2002; Braguinsky, Klepper, and Ohyama, 2009; Elfenbein *et al.*, 2010). While such skills may be necessary to realizing entrepreneurial ventures, they do not necessarily underlie judgment, even if they are complementary to judgment. Thus, some may argue that judgment is exactly that extra ingredient added to the above more mundane skills that makes an entrepreneurial venture “tick.”

While there is much to this view, and while we maintain that judgment is the cognitive faculty that is applied to those unique situations where no obvious or clear decision rule exists, the exercise of judgment may itself be seen as a skilled activity. In turn, skills are, of course, accumulated through experiential learning. Shane’s (2000) work clearly points to the important role of experience for entrepreneurship, or, in his case, “opportunity identification.” Thus, Shane conducts a series of case studies of entrepreneurs who each seek to exploit a single MIT invention but hold different stocks of experiential knowledge, and demonstrates that different opportunities are perceived by these individuals. Ardichvili, Cardozo, and Ray (2003) specifically point to the role for opportunity identification of special interest knowledge, and general industry knowledge, knowledge of specific markets, knowledge of customer problems, and marketing knowledge.<sup>15</sup>

<sup>15</sup> Lazear (2005) famously argues that entrepreneurs are likely to be jacks-of-all-trades, that is, their skill portfolios are broad rather than deep.

Such skills and knowledge play a role in entrepreneurial judgment, but how? As Sarasvathy and colleagues suggest (Sarasvathy, 2008; Dew *et al.*, 2009), such knowledge could in principle be fed into existing analytical frameworks (i.e., frameworks for industry and analysis, procedures for setting up business plans, etc.) to be used in a predictive and analytical way. However, Sarasvathy and her colleagues (e.g., Dew *et al.*, 2009) argue that this is exactly the approach of the “novice” (fresh, presumably, from the MBA), and that experienced, and successful, entrepreneurs follow an altogether different logic, namely that of “effectuation.” Effectuation is an incremental and flexible approach, in which goals are often adjusted under the impact of learning about what can be done with available resources and feedback from the nascent entrepreneur’s network.

Sarasvathy’s important work harmonizes in significant ways with our perspective.<sup>16</sup> She fully recognizes the importance of uncertainty in entrepreneurial decision-making and details a distinct approach for dealing with it. We see the effectuation approach as detailing some of the elements of judgment, in particular experience (as already indicated), but also creativity and ambiguity. Its emphasis on learning and experiential, local knowledge harmonizes with an Austrian perspective (Hayek, 1945). And its emphasis on the context in which entrepreneurial action take place is consistent with the approach to the entrepreneurial context, namely Austrian capital theory, that we develop in Chapter 5.

**Creativity.** Influential research (Csikszentmihalyi, 1996) posits that creativity can be understood in five stages: preparation, incubation, insight, evaluation, and elaboration. Lumpkin, Hills, and Shrader (2004) argue that prior experiential knowledge underlies the preparation and incubation stages, in a non-deterministic manner. During the insight phase the entrepreneur has his “Aha!” moment (Corbett, 2005: 478). The two last stages refer to market testing and actual opportunity exploitation. In essence, entrepreneurial creativity is about exploring, defining, and redefining the problem space in the pursuit of new opportunities, as memorably captured by Schumpeter’s

<sup>16</sup> Sarasvathy and Read (in press) are critical of our earlier work. However, we tend to see many more similarities than differences. Both her and our perspective emphasize the basic point that opportunities come into existence only as they are manifested in action.

(1911) notion of “new combinations.” In turn, such exploration is positively related to the experience: “Experts not only have a larger mental database of actual experiences to draw from, they also have better access to it than novices do” (Dew *et al.*, 2009: 291).

*Uncertainty preferences.* A key characteristic of entrepreneurship is often taken to be an above-normal willingness to accept gambles with unclear odds (Bhidè, 2000). This is not the same as having below-normal risk aversion (as in Kihlstrom and Laffont, 1979), but is rather a matter of ambiguity. The once-influential notion that entrepreneurs are less risk averse than the population at large seems now discarded (Caliendo, Fossen, and Kritikos, 2009), and many entrepreneurship scholars argue instead that entrepreneurs tend to come from the ranks of people who are particularly *confident* when they confront ambiguous decisions (Bhidè, 2000; Rigotti *et al.*, 2011) – even irrationally confident (Busenitz and Barney, 1997; Bernardo and Welch, 2001; Forbes, 2005; Koellinger, Maria Minniti, and Schade, 2007).<sup>17</sup> As Coase (1937: 249) argued in his summary of Knight’s ideas, “good judgment is generally associated with confidence in one’s judgment.”

*Summing up.* Profit, therefore, is a reward to bearing uncertainty, specifically a return that accrues to those entrepreneurs who are particularly optimistic in the face of ambiguity and who succeed with their entrepreneurial ventures (loss, of course, comes to those who are optimistic, but unjustifiably so).

### *Methods for meeting uncertainty*

To Knight, of course, the exercise of judgment, the entrepreneur, the firm, and the delegation of decision-making it allows for are different sides of the same problem of “meeting uncertainty.” We treat the role of the firm in greater detail in later chapters, and instead concentrate here on discussing some behavioral aspects of meeting uncertainty.

The entrepreneurship literature features a long-standing tradition of differentiating entrepreneurs and managers based on the degree to which they apply available information and calculative techniques:

<sup>17</sup> Ben-David, Graham, and Harvey (2010) argue that a particular form of overconfidence – what they call “miscalibration” – is prominent among corporate managers, suggesting that overconfidence may not be unique to entrepreneurship.

managers do, entrepreneurs don't (e.g., Schumpeter, 1911; Baumol, 1968). Instead, entrepreneurs rely on the "gift" of being able to "learn without deliberate search" (Kirzner, 1979a: 148) and on their "intuition," their "tendency to solve problems without explicit reasoning or analysis" (Mosakowski, 1998: 627). A refinement of this view is Alvarez and Barney's (2007) distinction between "discovery entrepreneurs" (who discover "objectively" existing entrepreneurial opportunities) and "creation entrepreneurs" (who create opportunities *ex nihilo*): While the former can usefully employ the analytical techniques taught in business schools, attempts to construct business plans and the like may be disastrous in the case of creation entrepreneurs.

The problem with these views is that they tend to place entrepreneurial decision-making in an unexplainable black box. However, a number of scholars argue, implicitly or explicitly, that this overly nihilistic conclusion is simply the result of the sway that the classical rational decision-making model holds. In reality, individuals deploy various decision heuristics to deal with uncertainty. Thus, Grandori (2010) draws on the philosophy of science, noting that scientists inherently confront uncertain decision situations, even if they are working within the bounds of normal science (see also Felin and Zenger, 2009). Indeed, many heuristics and procedures of established science are fundamentally procedures for dealing with uncertainty. Grandori argues that those heuristics are not particular to the scientific community, but are the same or close to the heuristics employed by entrepreneurs.<sup>18</sup> Grandori offers several examples of science-based entrepreneurs directly employing their learned heuristics from science to the uncertain situations confronting a new venture and serving to stimulate judgment of new potential opportunities. She finds that these entrepreneurs rely on "systematic observation, questioning and problem reframing by using 'theories' new to the field at hand [that] figure prominently as heuristics in the hypothesis generation phase" (2010: 484), and furthermore argues that these kind of heuristics apply outside of science-based entrepreneurship. For example, Zander (2007) provides an account of how the substitution of incandescent light for gas illumination in New York City was a result of Edison's judgment combined with meticulous market analysis, that is, systematic and

<sup>18</sup> Similar arguments have long been made by Brian Loasby (e.g., Loasby, 1986).

disciplined gathering of relevant data, following the formation of an initial hypothesis.

Read and Sarasvathy (2005) argue that because of its incremental and flexible features, an effectuation logic is particularly suited for dealing with uncertainty which tends to nullify the effectiveness of trying to get superior insight in the future, as reflected in detailed business plans, market forecasting, and so on. Effectuation allows the skilled entrepreneur to postpone decisions in order to reduce the ambiguity he faces. Flexibility in the face of uncertainty is the overall message. Similar arguments have been invoked to explain the role of the firm as an institution that exists to reduce uncertainty.

### *Judgment as ultimate decision-making*

In later chapters (7 and 8) we link the firm more directly to judgment and the need for flexibility in the face of uncertainty and ambiguity. Inspired by Knight (1921), we develop the notion of the firm as a *nested hierarchy of judgment*. In this model owners, who possess the ultimate rights to make decisions about resource allocation – akin to Grossman and Hart’s (1986) notion of *residual rights of control* – empower subordinates to make decisions on the owners’ behalf. These decisions made by employees may be critically important to the viability and profitability of the enterprise, but they are not the “ultimate” decisions about the firm, because these employees were selected and are retained by the firm’s owners, and their delegated authority can be taken away. Hence judgment is not simply decision-making under conditions of uncertainty, but decision-making about the resources the decision-maker owns and controls. Judgment, in this sense, represents “ultimate” decision-making (Rothbard, 1962: 602).

Kirzner (1973: 68) makes a similar point about alertness: it can never be fully delegated. “It is true that ‘alertness’ ... may be hired; but one who hires an employee alert to possibilities of discovering knowledge has himself displayed alertness of a still higher order ... The entrepreneurial decision to hire is thus the ultimate hiring decision, responsible in the last resort for all factors that are directly or indirectly hired for his project.” Kirzner goes on to quote Knight (1921: 291): “What we call ‘control’ consists mainly of selecting someone else to do the ‘controlling’.”

An important implication is that entrepreneurship, as ultimate decision-making about factors of production, is not itself a factor of production. A passage from the French economist Jean Marchal (1951: 550–551) expresses this nicely:

[E]ntrepreneurs obtain remuneration for their activity in a very different manner than do laborers or lenders of capital. The latter provide factors of production which they sell to the entrepreneur at prices which they naturally try to make as high as possible. The entrepreneur proceeds quite otherwise; instead of selling something to the enterprise he identifies himself with the enterprise. Some people doubtless will say that he provides the function of enterprise and receives as remuneration a sum which varies according to the results. But this is a tortured way of presenting the thing, inspired by an unhealthy desire to establish arbitrarily a symmetry with the other factors. In reality, the entrepreneur and the firm are one and the same. His function is to negotiate, or to pay people for negotiating under his responsibility and in the name of the firm, with two groups: on the one hand, with those who provide the factors of production, in which case his problem is to pay the lowest prices possible; on the other hand, with the buyers of the finished products, from which it is desirable to obtain as large a total revenue as possible. To say all this in a few words, the entrepreneur, although undeniably providing a factor of production, perhaps the most important one in a capitalist system, is not himself to be defined in those terms.

Entrepreneurship, in this sense, is embodied in the firm; the decision to be “entrepreneurial” is not a marginal decision, in the sense of supplying one more or one less unit of entrepreneurial services to the firm.<sup>19</sup> Writing of socialism, fascism, and other forms of government intervention in the economy, Mises (1949: 291) describes the struggle of business owners to operate in deteriorating political circumstances. Despite the threat of expropriation and other hazards, entrepreneurs will continue to act. “In the market economy there will always be entrepreneurs. Policies hostile to capitalism may deprive the consumer of the greater part of the benefits they would have reaped

<sup>19</sup> Menger’s (1871) treatment of the entrepreneur is similar: “The activity of the entrepreneur is recognized by Menger as being unique in that, unlike other goods of higher order, it is not intended for exchange and therefore does not command a price” (Martin, 1979: 279–280).



from unhampered entrepreneurial activities. But they cannot eliminate the entrepreneurs as such if they do not entirely destroy the market economy.” As long as there is private ownership, markets, and prices, there is entrepreneurship – regardless of the numbers of start-ups, patents, and the like.

Part of the reason economists speak of the supply of entrepreneurship and the marginal return to entrepreneurship is that they conceive entrepreneurship as an occupational category such as self-employment. An entrepreneur is a person who starts his own business, as opposed to an employee who works for someone else. In this sense it makes sense to talk about entrepreneurship as a factor of production with an upward-sloping supply curve. As profit opportunities increase, relative to wages, more individuals will choose self-employment over employment. If one conceives entrepreneurship as a function such as judgment, however, it cannot be treated as a factor of production and is exercised, as in the Mises quote above, even in the worst market conditions.

### **Judgment, complementary investments, and the unit of analysis in entrepreneurship research**

To repeat, we conceive judgment as decision-making under uncertainty over the use of scarce resources to satisfy future consumer wants. This typically involves making investments that are complementary to the entrepreneur’s idea. For reasons we discuss in greater detail in Chapter 7, the entrepreneur will take ownership of at least some of these complementary resources and will control the undertaking of at least some complementary investments. Thus, the entrepreneurial firm may be characterized as the entrepreneur, his specific judgment, and the assets that he owns or otherwise controls. In this section we explore what this means for the unit of analysis in entrepreneurship research.

First, note that the entrepreneurial firm is organized around an unpriced resource bundle (Lippman and Rumelt, 2003a). Thus, while there are factor markets for many of the resources that the entrepreneur controls, his own judgment is not one of those resources. Judgment, as we shall argue in Chapter 7, is non-tradable. Moreover, factor markets cannot easily ascertain how the

entrepreneur's judgment complements other resources. It is conceivable that the entrepreneur may be better off if the market could somehow evaluate the entrepreneur's estimated probability, that is, put a price on his judgment. It is not in general wealth-maximizing to control unpriced resources (Foss and Foss, 2005). However, a potential benefit of controlling non-tradable judgment is that it provides an information advantage with respect to understanding the value of the judgment in combination with other resources (Denrell *et al.*, 2003). In this case, resources can be purchased at a price below their net present value (Rumelt, 1987). Thus, fully understanding the returns to judgment requires understanding how judgment complements other resources. It requires considering a bunch of assets or investments.

Second, note that judgment pertains to a number of interrelated activities. The entrepreneur must decide which inputs to purchase, what investments to undertake, which managers to hire, and so on. Many of these decision situations are uncertain in the sense of Knight. Understanding the exercise of judgment requires considering it in the context of a bundle of assets or investments underlying those activities.

These points have implications for the unit of analysis in entrepreneurship research. Contemporary work tends to take the opportunity as the unit of analysis. Shane and Venkataraman (2000: 220) define entrepreneurial opportunities as "those situations in which new goods, services, raw materials, and organizing methods can be introduced and sold at greater than their cost of production." These opportunities are treated as objective phenomena, though their existence is not known to all agents. For Knight, in contrast, opportunities do not *exist*, waiting to be discovered (and hence, by definition, exploited). Rather, entrepreneurs invest resources based on their expectations of future consumer demands and market conditions, investments that may or may not yield positive return. Here the focus is not on opportunities, but on investment and uncertainty. Expectations about the future are inherently subjective and, under conditions of uncertainty rather than risk, constitute judgments that are not themselves modelable. As explained earlier, this means opportunities are neither "discovered" nor "created" (Alvarez and Barney, 2007), but imagined. They may or may not exist, in an

objective sense. Opportunities for entrepreneurial gain are inherently subjective, in the sense that they do not exist until profits are realized.<sup>20</sup>

This implies that treating opportunities as the central unit of analysis may not be optimal, as they are difficult to operationalize and measure. Rather, in a Knightian perspective, the unit of analysis should be the assembly of resources in the present in anticipation of (uncertain) receipts in the future, in other words, investments.<sup>21</sup> One way to capture the Knightian concept of entrepreneurial action is the notion of “projects” (Casson and Wadeson, 2007). A project is a stock of resources committed to particular activities for a specified period of time. (Opportunities are defined as potential, but currently inactive, projects.) Focusing on projects, rather than opportunities, implies an emphasis not on opportunity identification, but on opportunity *exploitation*. In other words, this perspective suggests that the key unit of analysis becomes the execution of business plans.

Making investment the unit of analysis suggests links to the real-options approach to the firm (Tong and Reuer, 2007) and an older literature on firms as investments (Gabor and Pearce, 1952, 1958; Vickers, 1970, 1987; Moroney, 1972). These literatures treat capital as not simply another factor that the entrepreneur can purchase at a price representing its marginal productivity, but as the ultimate, decision-making or controlling factor. Investment resources are allocated not to maximize the level of profit in a given project, but to maximize the (expected) rate of return across projects (just as divisionalized firms allocate internal resources across profit centers). If

<sup>20</sup> Confusion over the nature of opportunities is increasingly recognized. As noted by McMullen *et al.* (2007: 273): “a good portion of the research to date has focused on the discovery, exploitation, and consequences thereof without much attention to the nature and source of opportunity itself. Although some researchers argue that the subjective or socially constructed nature of opportunity makes it impossible to separate opportunity from the individual, others contend that opportunity is as an objective construct visible to or created by the knowledgeable or attuned entrepreneur. Either way, a set of weakly held assumptions about the nature and sources of opportunity appear to dominate much of the discussion in the literature.”

<sup>21</sup> An analogy with economics may be useful here: the analogy with preferences in microeconomic theory is clear – the unit of analysis in consumer theory is not preferences but consumption. In neoclassical production theory the unit of analysis is not the production function but some decision variable.

the entrepreneur-investor's ability to exercise control is limited, then she will not pursue all positive-net-present-value projects, only those she can supervise effectively. Hence individuals who create or discover opportunities, however defined, may be unable to pursue them without close ties to people willing to commit funds to projects. (We discuss this point further in Chapter 9.)

## Conclusions

It is not too unfair to say that until the 1980s (i.e., Bewley [1986] and literature growing from this paper), mainstream economists deliberately shied away from uncertainty in its Knightian sense. The uncertainty theme instead became a hallmark of heterodox approaches in economics, notably post-Keynesian and "radical subjectivist" Austrian approaches (Shackle, 1972; O'Driscoll and Rizzo, 1985; Lachmann, 1986), and was most often used as a critical point against mainstream economics rather than as a building block in positive theorizing. This relative neglect of uncertainty is arguably caused by the belief that under uncertainty "anything goes," indicating either the futility of theorizing uncertainty (the traditional mainstream stance) or, because uncertainty is ubiquitous, the irrelevance of the traditional model of rational decision-making (i.e., the expected utility model) (the heterodox stance).

In contrast, important earlier economists – chief among them Knight and Mises – emphasized uncertainty as a necessary ingredient in explanations of profit, and an important part of theorizing about social organization at large. Knight saw uncertainty as a necessary ingredient in understanding the existence of the firm. Knight and Mises also insisted that while uncertainty is ubiquitous, it does not follow that there are no rational grounds for acting. Thus, Knight emphasized judgment, and Mises entrepreneurial "appraisal" (Salerno, 1990a) as cognitive faculties that deal with uncertainty. Drawing on modern entrepreneurship research and its behavioral foundations, we argue that while there is indeed a significant element of "intuition" and "creativity" to judgment (and entrepreneurial appraisal), judgment can still meaningfully be thought of in terms of certain skilled behaviors, developed through experiential learning, and the confidence that one is capable of dealing with uncertain situations. Thus, judgment is not a mysterious black box. In the following chapter, we discuss some

of the important means in the entrepreneurial means-ends structure that judgment relates to. These means are capital assets. We argue that the Austrian approach to capital, updated by means of modern notions of property rights and transaction costs, is a useful complement to the judgment theory of entrepreneurship.