between cost and value that drives economic growth. A good hammer embodies subtle knowledge and skills, yet allows a vast range of applications that vary in their economic consequences. Some tools embody more knowledge than others—Lewin compares hammers and microscopes. This leads to realizing capital is social, embodying the knowledge of many people. At the same time the analysis becomes dynamic for situations change and knowledge, such as embodied in tools, becomes obsolete. Who needs to know PC-DOS? Ultimately capital is about structuring relationships between actors, knowledge, and entrepreneurial and social processes that are ever-changing across space and through time. In all, progress is marked by increasingly complexity and heterogeneity.

As for many of our authors, the idea that the individual's human capital is inalienable leads Lewin to a discussion of hold-up and agency issues. He argues the heart of the management dilemma lies in providing knowledgeable employees with decision rights optimal to the firm's performance—and we do not yet know how this might be done. Human capital management is thus differentiated from the management of other forms of capital by the agency problem, but the penetration of knowledge into all aspects of capital structure hugely increases its scope and significance. Lewin's answer is modularization. That knowledge and situations are heterogeneous opens up the possibility of finding some sympathy between the contextualized task, resources, and social boundaries—so modularizing economic activity. Modules, he suggests, are ideally self-defining and self-contained substructures whose inner workings are hidden from managers above. Lewin argues that this is what organizational design is about, bringing Hayek's ideas about the 'division of knowledge' together with Smith's ideas about the 'division of labor'.

Chapter 6

Part II's agenda is the relationship between human capital and the theory of the firm. There are, of course, several theories current in the literature today. Nicolai Foss's chapter focuses on the transactions cost view spearheaded by Williamson, a recent Nobel winner for this work, but also takes note of the property-rights approach of Grossman and Hart. Foss begins by defining human capital as 'the stock of valued skills, knowledge, insights, etc. controlled by an individual, the attributes of the individual that are valuable in an economic context'.

Theorists of the firm are not only concerned with defining firms by, for instance, contrasting them with markets, or explaining their existence. They are also concerned with alternative forms of organizational governance—in the case of human capital, understanding whether it is most efficiently sourced through market transactions, employment relations, voluntary organizations, or households. Foss claims transaction cost economics (TCE) has provided 'the first and still most comprehensive treatment of the organizational ramifications of human capital in economics'.

Yet it is 'not at the same level of detail as the human capital literature'—'It does not tell Mrs Jones what to do on Monday morning'. Both the TCE and property-rights approaches 'provide a rather abstract understanding of the efficient matching of transactions and governance structures or property rights allocations'.

Underpinning TCE is Coase's intuition that if transactions were costless their mode of governance would be irrelevant. Types of organization should be evaluated by their relative costs. Williamson argues a special category of cost arises because the employment relationship is marked by bounded rationality and opportunism. These are multi-transactional, marked by frequency and asset specificity. So he sees six reasons why assets may be difficult to deploy: (*a*) they are attached to a brand, (*b*) the need to act quickly (temporal specificity), (*c*) market size (dedicated assets), (*d*) localization (spatial specificity), (*e*) physical characteristics, and (*f*) specialized knowledge (human capital specificity). Along the lines of our previous chapters, Williamson uses these terms to define the socio-economic context of a transaction. Foss writes that asset specificity 'opens the door to opportunism', a restatement of the hold-up and agency issues noted earlier. The implications of the TCE approach are that transactions involving highly specific assets should be internalized within the firm and not conducted across a market. Given human capital is inalienable, it is especially specific in this respect.

Coase saw the employment relation as the essence of the firm. In the presence of uncertainty contingencies are costly to anticipate and rather than renegotiate each one firms make employment contracts. Coase defined these as arrangements under which the employee, for a specific remuneration, agrees to obey the directions of an entrepreneur within certain limits. The contract limits the entrepreneur's powers. Foss likens this view to Simon's notion of the employee's 'zone of acceptance', redefining managerial authority as the decision rights purchased through the employment contract. He concludes that the arrangement has little to do with knowledge asymmetry or human capital differences.

Foss argues Williamson goes well beyond the Coase—Simon analysis. While they treat human capabilities as generic, Williamson pays attention to the heterogeneity of human capital and the problems this raises. His lever is that as the division of labor advances so the worker's knowledge becomes increasingly specific and hold-up and agency issues intrude into the employment relation. Williamson sees four modes of labor contract: (*a*) sequential spot contracts—contract now for prescribed performance later, (*b*) contingent claims contracts—contract now for one of several prescribed performances, to be chosen later, (*c*) long-term contracting—determine performance later, and (*d*) establishing an authority relation alone—or 'fiat'. His concern differs from that of Lewin and the Austrian economists who see increasing complexity and a 'deepening' of human capital, rather it is the capital's increasing specificity and the governance problems generated, the 'separability of work relations' and the attendant difficulty of measuring employee performance. The framework leads to an in-depth analysis of governance under conditions of uncertainty and opportunism and Foss reports and summarizes extensive empirical research that confirms its power and relevance to management.

Foss then turns to the property-rights approach. This too stands on the incompleteness of the firm's contracts and deals with the need to allocate rights to residual assets, that is, those not allocated *ex ante* to employees or other agents. He notes that such controls determine the boundaries of the firm as a bundle of jointly owned assets. Under uncertainty control goes beyond the explicitly contractible to include subtleties of motivation, trust, and reputation. Foss notes Ghoshal and Moran's belief that employees perform in accordance with incentives and the opportunities offered, but also from their 'feelings for the entity'. Thus motivations are both extrinsic and intrinsic and the firm is seen as a 'carrier of reputational capital'.

TCE is a novel theory of the firm that offers a place for human capital within it. Williamson's focus is on the connections between its specificity and its governance. As in Lewin's analysis, Foss shows the human capital management insights the TCE offers turn on its inalienability and the particular governance challenges this raises. While the debates around the TCE are extensive and complex, its contributions are substantial. Foss urges theorists to pay it considerable attention.

Chapter 7

While Foss locates human capital within the transaction cost theory of the firm and shows how its heterogeneity gives rise to problems that drive the choice of governance mechanism, Spender's chapter locates human capital within principal—agent theory. He argues the agency problem can be defined as a human capital difference between principal and agent. The value of doing this is that the principal—agent relationship then describes a key feature of firms—the same employment relationship that Coase regarded as defining for the firm. We can, first, explore how a human capital approach might illuminate this theory of the firm. But, second, a critical analysis of agency problem theorizing might illuminate our notions of human capital. Spender's emphasis is less on human capital's heterogeneity, as either Foss or Lewin describe it, and more on the principal's decision-making when facing the agency problem. But unlike Foss's chapter, which presents TCE as a coherent body of work to which human capital's heterogeneity is essential, Spender's approach is more critical. He argues principal—agent theory is actually far from coherent and its shortcomings help us see human capital must be conceived more widely, extended beyond the customary 'knowledge and skills' notion to include the agent's ability to respond creatively to the uncertainties of practice. He implies a previously underconsidered dimension of human capital: an ability to deal with the unanticipated that must be added to the accepted ability to deal with the anticipated.

Spender begins by questioning the relationship between Becker's macro-level analysis of human capital as the output of the educational system and human capital as most of our authors see it, at the level of the firm. He moves on to surface some of the inconsistencies between the classic contributions of Jensen and Meckling and Fama. He argues Jensen and Meckling's analysis is essentially incoherent in that that it offers no rigorous solution in the absence of the perfect markets in which the various benefits to managers and owners can be priced. The paradox is that such markets can only exist under conditions of certainty, that is, when Knightian uncertainty is absent. But under such conditions principal and agent can negotiate a complete contract. Thus the conditions in which Jensen and Meckling's analysis 'works' are the conditions in which no agency problem can arise to demand their solution. Fama's analysis 'works' quite differently. While he too indicates solutions are contingent on an institutional context—which, as we have seen, is the real mark of human capital theory—his context does not comprise perfect markets. On the contrary, Fama appeals to the available imperfect markets for financial capital and management talent, in ways that cannot be modeled rigorously.

Spender argues this discussion illustrates the difference between (*a*) a theory—in the conventional philosophy of science sense of an apparatus for generating predictions (dependent variables) from discoverable facts (independent variables)—and (*b*) a social-economic 'framework' which indicates the actual context into which executive agency must be projected in order to achieve conceptual closure and reasoned action. This is the entrepreneurial act. Conversely the distinction illustrates how, under conditions of Knightian uncertainty, the application of human capital to any action, social or economic, must call for the actor's agentic capability. This argument stands opposed, as in Knight's analysis, to an analysis based on risk, population statistics, and the actor's risk propensity. Spender continues reviewing Mitnick's parallel approach to the principal—agent relationship. This turns on the notion of 'organizational slack', presuming some of the firm's resources are in an agentic 'potential' category, yet to be applied, just as some aspects of human capital are not applied until people are fully 'stretched'. Mitnick frames the interplay of tangible and intangible resources as a contextual aspect that must be addressed by calling up the actor's agentic capability.

As soon as agentic capability comes into the analysis new theories of the firm open up. Spender discusses two, one advanced by Foss in 1996, and another by White in 1991. Both turn on the notion that markets are extremely flexible—prices adjusting to supply, demand, technological change, product redesign, consumer taste, and so on. In contrast, most theories of organization, presuming certainty, prioritize stability and rigidity. Foss proposes that 'rather than conceptualizing firms as entities primarily kept together by transaction cost minimization, it might be better to view firms as entities whose primary role is to acquire, combine, utilize and upgrade knowledge'. This is the never-complete process that defines the firm's human capital as dynamic, focused on learning and responsiveness to the unanticipated. Spender argues that this shows the innovative power of differences of perception, interest, and thus human capital between principal and agent, allowing for flexibility and even the role reversals of real principal—agent relationships. The conclusion is that the inherent flexibility of the principal—agent relationship under Knightian uncertainty can only be contained by agentic appeals—like Fama's—to the institutional apparatus that defines its context.

Chapter 8

The previous chapters in Part II probed the nature of human capital by locating it within a specific theory of the firm—transaction cost (Chapter 6) and principal—agent (Chapter 7). Jeroen Kraaijenbrink's chapter examines how human capital relates to the resource-based view of the firm (RBV). The RBV claims to explain sustained competitive advantage. Kraaijenbrink takes a critical stance and poses three questions that this kind of theory of the firm should be able to address. (*a*) What are the assets that claim to explain the firm's sustained competitive advantage? (*b*) What is their value? (*c*) How might rents be generated and sustained?

But first he deals critically with the RBV's evident weaknesses—especially its vague notions of resource and value. Most RBV authors include the employees' human capital, and sometimes that of suppliers, customers, and others, as among the resources to be managed with a view to extracting sustainable rents. Wernerfelt argued: 'anything which could be thought of as a strength or weakness of a given firm' would be an RBV-relevant resource. Likewise Barney argued the relevant resources would comprise 'all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm'.

This seems fine, as far as it goes. But is anything excluded? Kraaijenbrink notes there is no analysis of how human capital might be differentiated from other types of resource for the RBV treats all resources as conceptually equivalent. This contrasts with the view advanced by many of our authors, such as Lewin or Foss, who argue it is precisely human capital's inalienability that leads to the special problems around managing it that our theorizing must address. Using human capital as a hammer Kraaijenbrink chips away at the RBV's tautological notion of resource. He points out an individual's human capital must often be shared with other entities, such as the family, and be applied under specific legal and institutional arrangements that limit the firm's usage—a reminder of Coase's theory of social cost. The RBV presumes full unproblematic title to the relevant resources.

Kraaijenbrink then turns to the RBV's notion of value, a theme running throughout the human capital discussion. While most of our authors see the value of distinguishing between input costs and output returns, the RBV is in special difficulties because of the tautology around identifying rent-earning resources by their ability to produce rents. In contrast, many of our authors argue resources of all types only reveal their value when combined with other resources—which lifts the analysis from the component level to a project or a firm level. The RBV is dismissive of collective capabilities, and of the distinction between human and group or social capi-