

A resource-based view of Schumpeterian economic dynamics*

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Abstract. This paper seeks to offer a theoretical platform where the modern “resource-based view” of the firm might meet with evolutionary economics and the study of entrepreneurship, and with the economics of industrial organization. It does so by proposing the concept of the “resource economy” within which productive resources are produced and exchanged between firms. This is presented as the dual of the mainstream goods and services economy – where the “resource economy” captures the dynamic capital structure of the economy. The paper is concerned to bring out the distinctive principles governing resource dynamics in the resource economy, capturing competitive dynamics in such categories as resource creation, replication, propagation, exchange and leverage; evolutionary dynamics in terms of resource variation, selection and retention; entrepreneurial dynamics in terms of resource recombination and resource imitation, transfer and substitution; and industrial organizational dynamics in terms of resource configuration, resource complementarities and resource trajectories.

Key words: Schumpeterian dynamics – Resource-based View – Resource economy – Evolutionary dynamics – Entrepreneurial dynamics

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1 Introduction

For as long as one can remember, the edifice of the neoclassical economic synthesis has been under attack. Critiques have focused on the extreme unreality of

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the assumptions that underpin the Arrow-Debreu theorems of welfare economics. They have queried the excessive formalism of the edifice, and the lack of practical significance of many of the results. They have castigated the neoclassical synthesis for its internal incoherence (lacking an independent theory of capital, for example, one of the favorite topics of the Cambridge school), its lack of a dynamic element, its non-evolutionary character, its lack of any conception of “market process” – and so the list could be continued (Blaug, 1997). Through all this, the neoclassical synthesis remains as strong as ever, impervious it seems to these or any other attacks.

In this paper a different tack is taken. The neoclassical edifice is left alone, standing as a representation of what goes on *in a certain kind of economy* – namely the economy where goods and services are produced and exchanged. The paper then introduces another kind of economy, namely an economy of productive entities – called “resources” – that are needed to produce the economy of goods and services. Resources also are produced and exchanged. As “capital goods” they are used by firms to transform inputs into outputs, but the resources themselves are not consumed. In their totality they can be said to constitute the “resource economy.” Now it turns out that the rules of production and exchange of resources are rather different from the rules governing the goods and services economy. Resources are not in general free-standing entities; they are tightly bound to firms. They can be accessed and exchanged – but usually through complex interfirm transactions. Resources are bundled together into firms – with the prime challenge for the firm being to build synergies between resources to ensure distinctiveness and generate entrepreneurial profits. The resource bundles within firms change over time, as firms adapt to changing circumstances, or as sudden new resource combinations are created – as described so clearly by Schumpeter in his *Theorie der Wirtschaftlichen Entwicklung* (1912/1934/1996).

Thus the resource economy is best approached from a dynamic and evolutionary perspective, where path dependence and trajectories are paramount, rather than in terms of the static framework favoured by the neoclassical synthesis. It also turns out that the resource economy can only be approached from the perspective of disequilibrium, since resource dynamics are under the control of entrepreneurial production plans that are always inconsistent in any real economy – as understood and defended by economists such as Hayek (1941) and Lachmann (1956/1978) as well as Schumpeter. Thus the “resource economy” takes us to the heart of capitalist dynamics.

The idea of “resources” of course comes from the “resource-based view” (RBV) of the firm, which is a school of thought that has risen to prominence in the strategic management literature. It is otherwise known as the “capabilities view” in which guise it has been taken up and discussed by numerous economists (see Foss (1997), Foss and Knudsen (1996) or Foss and Loasby (1998) for representative discussions). Calls have been made to develop a synthesis of the RBV of the firm with evolutionary economics (Montgomery, 1995) and with entrepreneurship studies (Hitt and Ireland, 2000). Yet the disciplines remain stubbornly apart. One of the goals of this paper is to explore the possibility that the notion of the “resource

economy” might provide common ground where these different discourses might meet, and where fresh insights might be generated.

To date, these various approaches have held back from developing a common language and set of concepts. The RBV of the firm, while making some welcome progress in accounting for the heterogeneity of firms (in terms of the distinctiveness of their resources and associated capabilities), has nevertheless stopped short of taking its insights into the wider economy. The RBV of the firm remains anchored to a view that sees firms developing their resources internally, ignoring the wider aspects of resource exchange.¹ The conventional RBV has made little use of any notion of shared resources or “extended” capabilities (Coombs and Metcalfe, 1999); moreover it appears to be wedded to an incumbent’s view of competitive dynamics, ignoring the challenger’s perspective and the strategies that challengers use to acquire or leverage resources externally. The RBV has also made little contact with the literature on the “market” for corporate control, which is concerned with the terms on which corporate assets are bought and sold. A focus on resources themselves, as fundamental entities, and their production and exchange in the wider economy, is needed to clear away these conceptual obstacles. The evolutionary view, for its part, discusses the evolution of firms, technologies, markets, or organizational “routines” – but rarely discusses the evolution of “resources” in general, with some important exceptions (Winter, 1995). Yet resources can be taken as a generalization in a certain sense of all these entities. Likewise the literature on entrepreneurship, with important exceptions, has remained detached from strategic concerns and has instead focused on equilibrium-returning features of the process. It is only recently that scholars have sought common ground (McGrath and MacMillan, 2000).

Thus an examination of the notion of a “resource economy” where firms trade productive resources with each other in order to enhance their competitive prospects, and build new combinations through entrepreneurial activities, and where these resources follow cumulative pathways exhibiting evolutionary dynamics, offers some hope of bringing these various fields together, and enriching them, in a way that it is independent of the concerns of the neoclassical synthesis.

2 The resource economy

Consider then, as an exercise in imagination, an entity to be called the “resource economy.” By this is meant the totality of productive entities that make the production of goods and services possible. Resources are the fundamental units of value generation. They do not exist independently, but are contained within firms. Resources can be specialized and bundled together in highly distinctive configurations, to lend firms special competitive advantages. Resources can be built by firms internally, and they can be traded – as described every day in the business pages of the newspaper. The production and exchange of resources is what we shall describe as the “resource economy.” Resources are the productive assets of firms, the

¹ Two of the influential contributions to the field, Barney (1986, 1991) and Dierickx and Cool (1989) discuss this issue (in terms of imperfections and incompleteness of “strategic factor markets”), but dismiss external sourcing since it is theoretically available to all firms and therefore cannot serve as a source of distinctive advantage.

means through which activities are accomplished. The basic insight that separates the RBV of the firm, and evolutionary economics generally, from conventional economic and industrial organization analysis, is that resources are seen as lending distinctiveness to firms, i.e. generating heterogeneity. There is no “representative” firm in the resource economy; the point is to model firms in all their heterogeneity, starting with their different resource endowments, and moving on to the dynamics of the processes through which these resource endowments may be changed (extended, contracted) through the development of routines and the inter-relations between firms (Eliasson, 1986). The firm’s resources set limits to what the company can do.² As such, resources include tangible entities such as production systems, technologies, machinery, as well as intangibles like brands, or property rights such as landing rights for an airline or bandwidth for a telecoms company.³

Resources then are the basic constitutive elements out of which firms transform inputs into outputs, or generate services. To provide an airline service, for example, a firm needs to acquire and consolidate resources such as aircraft with crews to fly them; landing slots at airports and the administrative capacities to operate them; passenger booking systems and the skills to operate them; aircraft maintenance facilities and skills, and so on. Building a distinctive “competence” out of these consolidated resources, the firm will enter into the passenger transport industry, and equipped with a certain strategy (e.g., targeting the business traveller) it will either succeed or not. Its strategic capabilities and the competitive advantages generated over rival firms, rest on the distinctiveness of the resources at its command. These will not necessarily have to be owned; indeed the firm may lease its aircraft, subcontract its maintenance operations, and even its ground operations, reserving only the core functions of actually booking passengers and flying them as its distinctive competencies. An airline building a national air service can build its routes one at a time, or it can accelerate the process by acquiring routes from one or more regional operators (or acquiring the regional airlines themselves). Thus resources can be assembled by firms to reflect their current strategic imperatives.

The resource economy as defined may be characterized as the dual of the mainstream, neoclassical “goods and services” economy. As pointed out by Wernerfelt (1984) products (activities) and resources are two sides of the same coin.⁴ By this is meant that they describe two facets of the same reality, namely a process of production of goods and services. In the economy as a whole, there are on the one hand the activities conducted by firms, which transform inputs into outputs; the terms used to describe these processes are the familiar ones of inputs, outputs, costs and prices. The object of analysis is to determine for any given set of inputs and outputs

² Rumelt (1984) was one of the first to link strategic direction with resources; he argued that the firm’s strategic significance is “characterized by a bundle of linked and idiosyncratic resources and resource conversion activities” (1984, pp. 561).

³ Teece, Pisano and Shuen (1997, p. 521) prefer the term “specific assets” by which they mean, the firm’s specialized plant and equipment, its “difficult-to-trade knowledge assets and assets complementary to them, such as its reputational and relational assets.”

⁴ As Wernerfelt (1984, p. 171) put it: “Most products require the services of several resources and most resources can be used in several products. By specifying the size of the firm’s activity in different product markets, it is possible to infer the minimum necessary resource commitments. Conversely, by specifying a resource profile for a firm, it is possible to find the optimal product-market activities.”

a set of prices which will clear all markets, i.e. produce an equilibrium balance between supply and demand.

In the resource economy, on the other hand, the object of interest is the configuration of resources, i.e. their distribution in heterogeneous and distinctive bundles, within and between firms. What is of interest is the adaptive capacity of such an economy, in terms of its abilities to generate new resource configurations, and the evolutionary pathways along which such resource configurations develop. These resources, in totality, account for the production of the goods and services that are described in mainstream economics. It is the same economy we are dealing with, but we are viewing it from a fresh perspective.

Resources are very real and very expensive. They are bid for, won and lost every day, as reported in the business page of the newspaper. The price that productive resources fetch (eg a division of a company, a cellular telephone license, a group of media titles and their editorial staffs) is usually much greater than their asset “book value” and is determined by corporate valuations, such as stock market valuations if the company is listed. So in one sense the answer to the question: what is the total worth of a nation’s “resource economy” is provided by the total stock market valuation of the economy’s firms. In another sense, the “value” of a resource is entirely a matter of strategic judgment – the same resource can have very different value for different firms, depending on the use to which it is put, or to the same firm at different points in time.⁵

The resources in a real economy are in a constant state of flux, accounting for observed phenomena of competitive and evolutionary dynamics. Resources are being developed by firms and being exchanged between firms, through open-market deals (eg as in the sale of a division of one firm to another) or more commonly through various kinds of contractual arrangements (eg technology transfer agreements, subcontracting/OEM agreements, licensing arrangements) or through resource transfers effected as a result of mergers or acquisitions. It is through these contacts that *resources are exchanged and shared* between firms, either voluntarily or involuntarily. These can be identified as cases of resource propagation, resource replication, resource exchange, resource redeployment, resource sharing and resource leverage.⁶ All are involved in the dynamics of the resource economy.

As emphasized in the “Austrian” theory of capital, the processes of resource exchange and dynamics operate in a non-equilibrium or disequilibrium framework – for the simple reason that equilibrium would entail perfect congruity of entrepreneurs’ business plans or business models. While equilibrium is at least

⁵ Resource valuation is a topic rarely tackled in the conventional RBV of the firm, which is perhaps one of the reasons it has not become a mainstream economic discipline. Valuation involves processes such as discounted cash flow and, where available, the valuation provided by stock markets. Insofar as resources are exchanged commercially between firms, the resource economy may be identified with the market for corporate control. However many more such processes of resource movement are encompassed in the concept of the resource economy.

⁶ On resource exchange, see Moran and Ghoshal (1999); on resource redeployment, as a result of horizontal mergers and acquisitions, see Capron and Mitchell (1998); on resource leverage, see Prahalad and Hamel (1990). On resource leverage as a resource-focused catchup strategy, see Mathews (1997a, b; 1998).

plausible (if unrealistic) in the markets for goods and services, it is neither plausible nor realistic in the case of markets for resources.⁷

It bears repeating that the restlessness of the resource economy is quite distinct from the activities of the firms embodying these resources – their production activities. Of course there could be a great deal of production and other economic activity without much resource exchange – and vice versa, there could be a great deal of “resource churning” (eg huge numbers of mergers and acquisitions) without much effect on the level of productive activity. But in general, one would expect to find in a productive economy a reasonable degree of resource exchange activity. The extent of this depends on the development of specialized markets for resources. Resource exchange takes place largely through bilateral contractual arrangements, without the mediation of a “market” at all. But some firms show exceptional enterprise and actually create “markets” for resources through their brokerage activities. Merchant banks in particular take the lead role in this.⁸ It is certainly an indicator of a very sophisticated economy when organized markets for resources start to appear – as “capital markets” made their early appearance and brought capitalist economies to a new level of sophistication.

3 Firms and resource dynamics

The first substantial issue to consider is how resources may be encapsulated within firms, and how firms may derive profitable opportunities from this bundling.⁹ To be plausible, our account of the resource economy must translate into an account of firms and their capabilities that is consistent with the Penrose view, and with the insights of the RBV. This leads to questions such as what determines the rate of growth of firms as resource bundles, the limits to this growth, and how these matters are translated into entrepreneurial and management practice.

The disposition of resources within firms is the outcome of entrepreneurial action, or it is bequeathed from earlier resource combinations (Galunic and Rodan 1998). It is the task of the entrepreneur to assemble a bundle of resources and to capture synergies so that revenues generated (returns from sale of outputs net of costs of inputs) exceed rents paid on the resources utilized; this is the task

⁷ See Hayek (1941) and Lachmann (1956/1978; 1973) for statements of this point of view; Lewin (1997) and Foss (1994) as well as Lewin and Phelan (1999) provide links between these views of capital and modern resource-based discussions of firms’ competitive advantage.

⁸ Merchant banks frequently recombine resources and launch them as new companies. For example Deutsche Bank in 1999 was assembling wireless communications licenses covering different parts of Europe in order to bundle them into a new corporate venture.

⁹ It was Edith Penrose in *The Theory of the Growth of the Firm* (1959) who developed the first clear expression of a “resource-based view” of the firm. She considered firms to be “bundles of resources” and saw the specialization of these resources as fundamentally accounting for the variations between firms. As Penrose put it (1959/1995: 24): “. . . a firm is more than an administrative unit; it is also a collection of productive resources the disposal of which between different uses and over time is determined by administrative [management] decision.” For a recent discussion of Penrose’s contribution, see Pitelis and Wahl (1998) as well as Foss (2000).

of producing positive entrepreneurial profits.¹⁰ It is the task of management to utilize such a resource stock and extract the most productive services from it in transforming inputs into outputs. The range of goods and services to be produced with the services provided by such a resource stock cannot be known in advance; it is a matter of discovery, a process of learning, where the outcome depends on the management's knowledge, experience and capacity for imaginative experiment. Management seeks to capture synergies between resources (utilizing a resource bundle for more than one kind of activity, or to produce goods for more than one kind of market). The capture of such synergies is the resource-economy equivalent of co-specialization of assets and the capture of cost-based economies of scope in the goods and services economy.¹¹

What accounts for the growth of firms is their propensity to develop management or organizational "routines" which then liberate management attention to investigate and discover further development and diversification opportunities. Penrose (1959) puts this in terms of management capturing the services of an "excess" of resources that call for diversification into production of new products or entry into new markets. What then limits the size of firms, or their rate of growth, is the managerial burdens of keeping track of these diversifications. In the end, the firm can "pay attention" only to so many different kinds of activities. In the end, it can forge an effective union out of only so many resources; beyond that limit, at any time, the firm functions as no more than a conglomerate, where its resources have no synergistic interaction (and the whole is therefore no more than the sum of the parts). Such a disaggregated firm is a prime candidate for a hostile takeover.

This then is a behavioural account of the process through which managements are led to seek diversification and new market entry, based on an existing stock of resources, and why they are led to seek to combine those resources with others (eg through mergers and acquisitions) to further enlarge their "strategic options" (Itami, 1987). It works on the basis of a notion of "disequilibrium" within the firm, where the potential services rendered by a stock of resources is out of balance with the actual services being secured through the firm's existing organizational routines.¹²

¹⁰ Note in this treatment I am not making assumptions as to whether resources are available at less than full cost on "imperfect" factor markets – as done within the RBV approach by, e.g. Barney (1986). I am making the conservative assumption, along with Schumpeter (1912/1934/1996) and earlier capital theorists such as Clark (1888), or Fetter (1904; 1927) that entrepreneurs pay full costs for the capital goods (resources) utilized. In this way I bypass completely all the complications associated with Ricardian treatment of rents as stemming from resources that are "rare" or "fixed." It is much more straightforward to assume that resources are available and can be secured, and that what counts is the packaging or bundling of the resources into a distinctive whole within the firm. Clark (1888) made the distinction between "capital" (as a fund) and capital goods, which included land and all productive factors; while Fetter simplified notions of rent to argue that rents are the earnings of any factor of production, irrespective of their rarity or fixity.

¹¹ Teece (1986; 1992) has developed an account of the dynamics of firm diversification in terms of the co-specialization of the assets involved and the capacity of managements to appropriate the services of these assets.

¹² Loasby (1991), building on the work of Hahn, has developed a formulation of this process in terms of attaining an "equilibrium" within the firm between the services provided by the current resource base and the services required by the current range of goods and services produced. This is a striking way of expressing the core of Penrose's argument. But of course it is a completely different use of the term

We shall discuss below the analogue to this intra-firm resource disequilibrium in the form of an economy-wide resource disequilibrium, which generates the motive for entrepreneurship.

In passing, it is worth noting that this provides a plausible foundation for a theory of management. Given a stock of resources within a firm (assembled through entrepreneurial action or bequeathed) it is management's task to develop the "organizational routines" needed to capture as many of the services from these resources as possible. Management has the task of rationalizing the resource base, in order to capture synergies. Yardsticks to measure management performance are then its effectiveness and efficiency in developing, and adapting, the routines needed to put in motion the firm's resource stock. This is a theory of management which is concerned with maximizing the creation of value through discovering new activities, rather than appropriating as much value as possible (through cost cutting) from a given set of activities – in keeping with the best of current treatments of the management function (Ghoshal, Bartlett and Moran, 1999).

To summarize the discussion so far, what we have is a picture of the economy where firms are built from encapsulated resources, and operated [managed] with a view to building and capturing resource synergies. Firms are involved in actively accumulating resources to enhance their dynamic distinctiveness and capabilities (Teece, Pisano and Shuen, 1997). As firms translate their newly discovered activities into "routines" so management attention is liberated for further discovery, and they are led to grow and diversify, building on their "excess" resource base, ie on a disequilibrium in their resources. Successful diversification is based on co-specialization of resources that act synergistically with each other.¹³ Firms seek complementary resources from other firms with which they have direct dealings, through the dynamics of resource propagation, replication, leverage and transfer. These constitute the exchange dynamics of the resource economy, driven by disequilibrium considerations (rather than the equilibrium considerations which govern neoclassical analysis of the goods and services economy).

What drives firms in these patterns of behaviour is the competitive dynamics of an industry – the role played by rival firms, as well as by potential partners and other kinds of organizations. So we turn next to the analysis of competitive dynamics from the resource perspective, to see what added insights may be gleaned from this approach.

4 Competitive dynamics: incumbents and challengers

Firms are in unrelenting competition with each other, in terms of their products and services. Price competition is the primary vehicle through which these dynamics

'equilibrium' from its use in neoclassical economics, and it goes against the grain of the 'disequilibrium' tone of reasoning adopted in this paper – and therefore it is not pursued here.

¹³ Substantive predictions follow from this account, such as that the "value" of firms will reflect the degree to which managements have succeeded in capturing resource synergies. Empirical work designed to test such predictions would have to utilize a value parameter such as *Tobin's q*, and proxies for the firm's resources – as is done in studies which seek to capture the effects on firm value of diversification. For a recent review of the issues involved, see Steiner (1996).

are expressed, as well as qualitative attributes like time to market, product quality, customer responsiveness and innovation – as described in the analysis of the goods and services economy. In the 1980s a vision of firms locked in competitive struggle within an “industry forces” framework was developed (Porter 1980; 1985). The basic assumption, in keeping with the neoclassical synthesis, was that firms are more or less uniform; what distinguishes their performance (and their potential sustainable competitive advantage) is the industrial setting in which they find themselves. Industrial pressures are transmitted through processes such as barriers to mobility that keep firms locked in (and out of) industries.

This “industry forces” view of competitive processes, based on a view of firms as homogeneous, has given way in the 1990s to an approach that sees firms as heterogeneous, and looks inside firms, to their resources, for an account of competitive performance. The essential insight of the RBV of the firm as developed in strategic management has been that underpinning these competitive struggles in product markets lie the attempts by firms to secure sustainable competitive advantages through the distinctiveness of their resource base (Wernerfelt, 1984; Barney, 1986; Dierickx and Cool, 1989; Peteraf, 1993, Amit and Shoemaker, 1993; and for a critical perspective, Foss, 1998, or Foss and Knudsen, 2001). Thus there are multiple levels to competitive dynamics. The most obvious and superficial level is that of product competition. Beneath that there is competition over product ranges and families, eg brand loyalties from one product to another, and product architectures (eg the Intel Pentium series of microprocessors). And beneath this level is the most fundamental of all, namely the underlying resources (assets and capabilities) that enable firms to consistently bring out new competitive products and thereby circumvent their rivals.

This is the insight that has generated a new perspective on the competitive dynamics of the resource economy. Firms are competing with each other, at the most basic level, through emulation, variation and substitution of each other’s resources. *It is the competitive struggle over resources that may be viewed as the fundamental driving force of the capitalist economy.*

There is a Marshallian and a Schumpeterian dimension to these resource-based competitive dynamics. Marshall’s conception of competitive dynamics involved firms with varying strategies and programs each implementing their different approaches; the market then “selected” the most appropriate strategic arrangement in line with current demand and industrial preferences. The Marshallian processes of competitive dynamics are observed every day as firms compete not just in terms of prices but in terms of their complementary offerings, involving technologies, or products connected together in value-chains. In industrial districts, the Marshallian forces may be seen in terms of the sharp competition between suppliers of similar goods or services, and the collaboration between complementary suppliers linked in a value chain. These are the origins of increasing returns in a manufacturing district – as discussed with perfect clarity by Young (1928).

Marshall captured an essential feature of these processes in the distinction between the economies which a firm could introduce for itself (internal economies) and those introduced by other firms but which are of benefit to the focal firm (external economies). In doing so, Marshall was able to reconcile the phenomena

of increasing returns and inter-firm competition: the firm's activities are subject to diminishing returns, but the benefits it derives from other firms (externalities) enable increasing returns to be secured.¹⁴ Translating across to the terms of the resource economy, it may be observed that firms derive advantages not just from the resources they embody themselves, but also from resources *external to the firm* to which the firm can secure access. Following Richardson (1972) we may call these complementary resources.¹⁵ These are the critical insights, traceable to Penrose and Richardson, which have remained under-utilized in the RBV of the firm as developed in the strategic management literature.

4.1 Schumpeterian competitive dynamics

The more fundamental and sweeping kind of competition that drives capitalist dynamics is captured by Schumpeter's conception of the "creative gales of destruction" that regularly sweep through the capitalist system, initiated by entrepreneurs who break with existing arrangements in order to try out new combinations. From a resource perspective, such entrepreneurs are accomplishing *resource recombination* – one of the most powerful factors driving competitive dynamics.¹⁶

Of course Schumpeter did not use the language of resources, which has only come into vogue in the 1980s and 1990s – but it is easy to translate Schumpeter's insights into the language of competitive resource imitation and substitution. From the resource perspective, the Schumpeterian dynamics may be captured in terms of *resource imitation*, *resource transfer* and *resource substitution*. (These are the terms used in the RBV of the firm.) It bears repeating that we are talking here of processes at the resource level, not at the level of the goods and services produced from the resources.

The RBV of the firm emphasizes the sustainability of competitive advantages due to resource endowments. To do so, it is focused almost exclusively on the extent to which firms can capture resources that are difficult to imitate and not easily

¹⁴ Prendergast (1992, p. 460) puts the matter in these terms: "By the time he published the first edition of his *Principles*, Marshall had formulated an ingenious theoretical solution to the problem of reconciling increasing returns and competition within the framework devised by Cournot. The solution involved the introduction of the concept of external economies which were viewed as the sole cause of increasing returns within a regime of competition. Interpreted as a perturbation of a firm's unit-homogeneous production function caused by changes in the output of the industry as a whole, external economies are a device of considerable power and elegance . . ." For a critique of this position, see Hart (1996).

¹⁵ Richardson (1972) referred to firms' activities and capabilities; he used capabilities very nearly in the sense referred to here by resources. Complementary activities are those which bind firms together in contractual arrangements, thus forming larger aggregates which constitute the "organization of industry." These issues, which have been ignored in the conventional RBV of the firm, are taken up below.

¹⁶ As Schumpeter himself put it (1942/1975, p. 84): "... in capitalist reality as distinguished from its textbook picture, it is not (price-guided) competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization (the largest-scale unit of control for instance) – competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives. This kind of competition is as much more effective than the other as a bombardment is in comparison with forcing a door ..."

transferred or substituted. This has always struck me as extremely odd. It takes an incumbent's perspective – whereas economics should, and normally would, be more concerned with promoting competition, and would therefore take a challenger's perspective. In the competitive dynamics as developed in this article, we are concerned with neither incumbent nor challenger advantage, but with how both incumbents and challengers drive each other to higher and higher levels of economic performance.

4.2 The incumbent's perspective: Uncertain imitability of resources

It is through uncertain imitability of resources that incumbents are able to establish sustainable competitive advantages. The more that incumbents are able to create (resource-based) isolating mechanisms, the more sustainable their advantages. Lippman and Rumelt (1982) and Rumelt (1984) introduced these ideas in the explicit context of a resource-based view of strategic competitive dynamics. They demonstrated how an analysis at the level of resources would shed light on the sources of sustainability, ie through uncertain imitability; Rumelt introduced the idea of an “isolating mechanism” as the (resource-based) firm-level analogue of mobility barriers (Caves and Porter, 1977) at the industry level.

For our purposes, where we are concerned as much with a challenger perspective as with incumbents, the Lippman and Rumelt theorem tells only half the story. The complementary proposition concerns how challengers successfully confront incumbents, even when they have built a resource base on causal ambiguity and strewn the competitive landscape with as many “isolating mechanisms” as they can devise.

4.3 The challenger's perspective: reliable imitability

It is through the fundamental imitability and transferability of resources that challengers are able to invade industry segments occupied by incumbents. Challengers acquire the requisite resources through internal development and through external leverage, where they are guided in their choice of which industry segment to attack by the availability of resources that are most easily imitated and transferred. We may coin the expression “reliable imitability” for such an approach, to bring out the complementarity with the uncertain imitability of Lippman and Rumelt.

Reliable imitability depends for its plausibility on such features of the resource economy as path dependence. Technologies, for example, are known to evolve along “trajectories” that reflect the path dependence of cumulative design and utilization decisions (Dosi et al. 1988, 1997). In resource terms, this may be described as a case of predictable resource evolution (as discussed below). Now a challenger can “read” a technological or resource trajectory as well as an incumbent – in fact, it can probably read the trajectory better, because it is unencumbered with the prior

commitments that create inertia for firms, and make it so difficult for them to swing into new technological trajectories.¹⁷

If resources were non-transferable and non-imitable, then incumbents' competitive advantages would be sustainable forever. But firms are able to diversify and challenge incumbents' positions. They are able to do so because they adjust their resources to their strategic needs. A goal of entering a new market needs to be thought through, from the resources perspective, with an analysis of the resources required to support such a shift. This is what Itami (1987) calls "dynamic resource fit" and he gives numerous Japanese examples of firms building their resource base, or acquiring new resources, in order to support their new strategic thrust. Firms are able to draw on multiple connections, from industrial networks or supplier networks, in effecting these resource transfers. East Asian firms in Korea and Taiwan and Singapore have all learned much from these Japanese examples, and have applied the lessons in their own attempts to "leverage" resources from advanced firms in advanced countries. The case of the creation of a semiconductor industry in East Asia, entirely through strategies of resource leverage (knowledge, technology, market access) is one of the best examples of this process at work. The strategies pursued by the firms involved sought to make up their initial disadvantages in terms of their "latecomer" advantages – such as being able to read technological trajectories, and take advantage of the availability of process technology equipment from third party vendors. These are ways in which the imitation of a given resource base may be made more "reliable" (Mathews, 1997, 1998, 2001b; Mathews and Cho, 1999, 2000).

Competitive dynamics shape the rise and fall of firms within an industry setting at any moment in time. Incumbents seek to defend their position, through the uncertain imitability of their distinctive resource base. Challengers are constantly seeking ways to evade this resource base, or to appropriate it, through imitation, transfer and substitution of resources. Their success can be grounded in the sources of reliable imitability, such as the tendency of resources to evolve along certain well-defined trajectories. So we turn next to consider the evolutionary dynamics of the resource economy.

5 Evolutionary dynamics

The ingredients of an evolutionary approach in economics are now reasonably well-defined.¹⁸ It is clear that a consistent and coherent account must identify some

¹⁷ Henderson and Clark (1990) and Henderson (1993) give the graphic example of semiconductor equipment supply firms, where in each successive generation of the technology, the previous leading firm was unable to make the transition; this is plausibly interpreted by Henderson and Clark as a case of organizational failure to accommodate new technological architectures. The argument clearly carries over to the resource economy, where firms committed to a particular resource trajectory will find it difficult to accommodate new resource variations. This is the challenger's advantage, and the source of "reliable imitability."

¹⁸ For an introduction, see Dosi and Nelson (1994); the definitive treatment is by Nelson and Winter (1982). Langlois and Everett (1994) provide an illuminating discussion informed by a reading of the current evolutionary debates in the biological sciences. Andersen (1994), Hodgson (1993), Witt (1992),

category or categories as unit of variation and something else (or the same) as unit of selection, together with an account of the actual processes involved in generating variations and selecting entities according to some designated “fitness” criterion. Furthermore there has to be some kind of “inheritance” function, or entity which accounts for retention. The point of course is that such a theoretical structure has nothing in common with the comparative statics of the neoclassical synthesis; it represents a completely different way of visualizing the workings of the economic system.

It was Nelson and Winter who first formulated a clear evolutionary account, as an alternative to the static, optimizing account of mainstream neoclassical economics.¹⁹ They did so in terms of firms (as “phenotype”) and their “organizational routines” as “genes” (or genotype) seeing these as lending continuity to economic life, as opposed to the random fluctuations and optimizing responses to prices envisaged by the neoclassical view. The resource-based view as extended in this paper can take over this description provided by Nelson and Winter, and subsequently elaborated, with the proviso that it is not “routines” but resources which are acting as the units of variation, selection and retention. The resource based view of the economy thereby provides a unifying account of the processes of economic evolution, via the dynamics of resource variation, selection and retention.

The distinction between variation and selection of “resources” as opposed to that of “routines” (Nelson and Winter) is subtle but important. Nelson and Winter argue that organizational routines are “sticky” in the sense that they vary slowly, and are “inherited” by successful firms as they grow and develop. Exactly the same arguments carry over to resources, but with even greater force. Resources as defined here are clearly good candidates for vehicles of variation and selection, in that they are explicitly exchanged between firms, as part of a process of adaptive learning.²⁰

It was argued above that routines are the behavioural expression of resources. Managements utilize the firm’s distinctive resources by creating routines; this is the origin of the firm’s propensity to grow and expand, as managers look to extract enhanced services from “routinized” resources. Now the argument is transposed to an evolutionary context. If it is the underlying resources that are varying, then they are creating selection pressures which are experienced in terms of successful routines of competitively successful firms. This is interpreted by managements as “best practice.”

and Metcalfe (1998a,b) provide expositions of the evolutionary approach to economics from different perspectives, while Vromen (1995) provides an extended comparison of evolutionary schools of thought.

¹⁹ See discussions by Nelson and Winter (1974, 1982) and the individual contributions of each author, such as Winter (1964) and Nelson (1994).

²⁰ See Hutter (1994) for a discussion of the issue of what is the unit that evolves. Mathews (2001a) elaborates on this, introducing resources, routines and firms’ relations as three fundamental categories of a simplified economic framework termed an “industrial market system.” Evolutionary pressures operate then on resources, routines and interfirm relations, that are the “units that evolve” – they are changing through firms’ adaptations and through sudden recombinations.

5.1 Co-evolutionary resource dynamics

In biological evolution, the phenomenon of species co-adapting to changes in their environment is frequently observed, so that they become co-specialized with respect to each other. This is termed co-evolution. Numerous examples include the microorganisms that evolve in the guts of certain mammalian species, or the ants that co-evolve with certain kinds of acacia to provide mutual advantages. Now it is coming to be observed that business works also according to co-evolutionary principles. Firms for example encourage business units to evolve in different but complementary directions, allowing them to seize opportunities for collaboration where they present themselves – rather than imposing predetermined patterns of divisionalized operation on them.²¹ From a resource perspective, the notion of co-specialization of resources both within and between firms can be interpreted as the expression of co-evolutionary dynamics.

If resources can be described in terms of their evolutionary and co-evolutionary dynamics, what then is the significance of this perspective for economic performance? Variety is the driver of evolutionary dynamics, whether we are talking about technologies, firms or resources. This is the core of the Fisher principle, the “fundamental theorem” of systems in evolutionary motion. It states, when applied to competitive economic systems, in the words used by Metcalfe (1994, pp. 328) that “the rate of change of average behavior within a population of competing firms is governed by the degree of variety in behavior within that population.”²² The key issue then is how resource creation can exceed resource destruction to enhance the resource variety and diversity that drives economic learning and adaptation, i.e. evolutionary success.

Resource variety is generated by new combinations and, sometimes, by genuinely new resources, as in the case of a new technological standard emerging and driving the spawning of a new industry. This brings us to the consideration of entrepreneurship, innovation and technological dynamics, involving issues such as path dependencies, lock-in, adaptive learning and technological trajectories.

6 Innovation and entrepreneurship: Schumpeterian resource dynamics

From the resource perspective, novelty in the economy is generated principally through resource recombination, and the principal agents who accomplish these recombinations are entrepreneurs.²³ Schumpeter had the clearest possible conception that it was entrepreneurship which created new lines of development within

²¹ See Eisenhardt and Galunic (2000) for a recent exposition of this perspective.

²² Metcalfe (1994, pp. 328–329) notes that: “Implicit in this view are the four central themes of the evolutionary perspective: that it is differences in behaviour between firms which drive the evolutionary process; that these differences are evaluated economically within a population of competing behaviours; that this evaluation generates selective pressure to change the relative performance of each distinct form of behaviour in the population; and, that these behaviours are subject to inertia, changing slowly relative to the changes imposed by selection.”

²³ Schumpeter developed such a theory of entrepreneurship, in the sense of initiating new lines of economic development, in his *Theory of Economic Development*. This classic was first published in German in 1912 (frequently erroneously cited as 1911 – yet the 1912 date of publication is clearly

an economy, in ways that could not be anticipated through analysis of the “circular flow” economy. Entrepreneurial initiative created new activities, whose profitability then attracted imitators, and so the resource distribution in the economy as a whole is shifted.

There is an uncanny resemblance between this Schumpeterian conception of economic dynamics and Kant’s great theory of moral action; perhaps Kant was present in Schumpeter’s mind as he was writing. Kant created a conception of a universe of causality in which scientific laws rule supreme, but in which new sources of causal chains can be created by acts of the will, i.e. a willed action by a human creates a chain of events whose links can be explained by science, but whose origin can only be accounted for in terms of moral values and free will. This is what Kant meant by his being transfixed by the two great phenomena of our existence – the starry heavens above (the universe and its regularity explicable by scientific laws) and the moral law within. Schumpeter’s analogue is the entrepreneur who creates a new “line of business” which redistributes resources in the circular flow, and which once it is up and running, is amenable to traditional economic analysis.

Like Schumpeter, we keep a firm dividing line between “entrepreneurship” and “innovation.” Sometimes the two coincide, as when a technologist develops a completely new product or process concept and starts a new company to exploit it. But usually the two are best treated separately.

6.1 Entrepreneurship: new resource combinations

From the resource perspective developed here, there is virtually nothing to be changed in Schumpeter’s account. The resource economy is where resource recombination occurs. (Schumpeter: new enterprise formation occurs outside the “circular flow” of normal economic events.) New enterprises are created through new combinations of existing resources, adapted to new perceived needs or opportunities. (Schumpeter: new enterprises are created through recombination.) The new combinations are assembled not by managers but by entrepreneurs or other corporate promoters (eg a merchant bank); it is the entrepreneur/promoter who establishes the firm’s initial business strategy on the basis of the particular combination of resources assembled. (Schumpeter: It is the entrepreneur who initiates a new sequence of economic operations – as the “new employment of existing production goods” (1012/1934/1996, pp. 136)).

Day (1986) has provided an intriguing reinterpretation of Schumpeter’s entrepreneurial function in terms of disequilibrium dynamics of the goods and services economy. He takes the position that in any real setting the “circular flow”

shown on the first German edition, *Theorie der Wirtschaftlichen Entwicklung*, published in Leipzig by Verlag von Duncker & Humblot. This first edition carried seven chapters, with the seventh chapter treating “the economy as a whole.” A second German edition was published in 1924, dropping the long seventh chapter, and an English translation of this second edition was published by Harvard University Press in 1934. The Transaction Publishers edition was published in 1996; hence the bibliographic reference to TED as Schumpeter (1912/1934/1996). Much interest surrounds the “lost” seventh chapter of Schumpeter’s great work, since it provides an overview of his method and approach. For a useful introduction to the text, in the context of Schumpeter’s early career, see Swedberg (1991).

would rapidly swing wildly into disequilibrium, with one cycle of price formation and production decisions feeding off another to produce unstable swings – exactly as are observed in reality. He maintains that entrepreneurs actually bring stability to this unstable system, by identifying the sources of disequilibrium and initiating new actions that are then embodied in corrective fashion in a new round of the “circular flow.” From our perspective, it is disequilibria in the goods and services economy which provide the stimulus for entrepreneurial action, combining and recombining resources in order to produce a new set of goods or services. Entrepreneurs have the capacity to translate the disequilibria into resource terms, and to visualize how a new resource combination can be effected to “correct” the disequilibrium identified. This is a nice way of illustrating the duality of the goods and services economy and the resource economy: entrepreneurs are guided by signals from the goods and services economy but their actions are conducted in the resource economy, which in turn change the dynamics of the goods and services economy.

6.2 Innovation: new resource creation

There is hardly a term in economics that has attracted as much confusion as “innovation.” Is it the appearance of totally new forms, or their uptake in the economy? The term is frequently taken to imply much more than technological novelty; it can span the appearance of new marketing forms, or new organizational arrangements, or any other economic activity that shows signs of novelty. From the resource perspective, these ambiguities may be dispelled: innovation may be identified *tout court* with the creation of new resources – resources that have not existed before, as distinct from resource combinations achieved through entrepreneurial action.

An example of a completely new resource is a *technological standard*. Suppose that we regard a technological standard as a “resource” – since it becomes widely available as such, to a variety of firms, and not just to the originator.²⁴ Resource creation in this sense is needed to drive the formation of new industries and their diffusion. This is generally beneficial in its effects. But standardization can also lead to perverse outcomes, as for example where one resource is *created* and then *propagated* on such a scale that it precludes the creation of another, perhaps superior resource. This is a case of “lock-in” where the success of the inferior resource is generated through increasing returns.²⁵

While interesting, lock-in effects are simply an extreme form of the more general phenomenon which may be described as *resource trajectories*, or path dependence (Antonelli, 1997). It is another way of saying that “history matters.” From a resource perspective, resource accumulation, within firms and in the wider economy, can

²⁴ Standards can be interpreted as equilibria where users are agents with multiple technical choices (Cowan and Miller, 1998). But such game-theoretic formulations, while illuminating, miss the essential dynamic features of standardization. Often it is not foresight and calculation on the part of agents which leads to the emergence of a standard, but the outcome of unforeseen technological dynamics.

²⁵ Such lock-in effects are discussed by Arthur (1989), where the wide adoption of the perhaps inferior technology in itself generates “network externalities” that preclude the other, perhaps superior, technology from being started. The case of the QWERTY typewriter keyboard is the most famous such case (David, 1985).

clearly be expected to follow certain trajectories, or pathways, given that firms tend to develop their resource stock based on what they already have. There is nothing counter-intuitive in resource accumulation following a trajectory. Moreover, whole systems of firms may generate resource configurations that become “locked-in” in inferior economic performance. Resource pathways in this manner become of fundamental significance for economic performance, which in turn is linked to the issues of industrial organization.

7 Industrial organization and economic performance

The resource economy perspective is concerned not primarily with individual firm development, but above all with the interactions between firms – or with the “organization of industry” itself. The fundamental feature of an economy is the patterns through which the actions of economic agents are coordinated with a view to enhancing overall economic performance. I shall refer to *economic performance* as opposed to the performance of individual firms which populate the economy. I wish to demonstrate that this is critically linked to the way that resources are distributed within the economy, both within and between firms – in other words, to paraphrase Adam Smith, that economic performance is limited by the organizational configuration of resources within the economy.²⁶

7.1 Organizational configuration of resources

Enhanced performance at the economic level, as at the organizational level, can be captured through specialization and the emergence of intermediate input suppliers, which in turn is associated with decomposing a process into a finer division of labour. Consider the case of a group of firms, each specializing in a particular range of products and overlapping with each other in terms of their resource. As the market expands, some firms can specialize in intermediate subassemblies, to create more complex value-adding pathways within the industry. Standardization of subassembly modules enables potential economies of scale to be captured, and an organizational reconfiguration of resources to be effected. It is the possibility of intermediate specialist activities emerging, as the scale of the market expands, that drives specialization of resources – as anticipated by Adam Smith.²⁷ If these activities are conducted by new, specialist firms, it is a case of horizontal division

²⁶ It was Richardson (1972) who drew attention to these issues, by introducing a range of firm interactions laid out across a spectrum whose endpoints were the integrated firm at one end and the open, anonymous market at the other. Utilizing a classification of activities as “similar” and “complementary” he argued that similar activities would be carried out within a single firm (under unified management) while dissimilar activities would be coordinated through the market. Complementary (but dissimilar) activities would be coordinated by direct negotiation between firms (as in various kinds of contractual arrangement). Without damage to Richardson’s argument we may translate the terms across to resources. It is thus complementarity of activities which induces firms to act together, in order to pool resources, or to find ways to service the activities from a common resource.

²⁷ As expressed by Richardson (1996/1998: 168): “where the scale of an economic activity increases, it will be practicable for component processes within it to be separated out. In general, the cost savings

of labour (Langlois, 1989). If the activities are conducted within the same firm, it is a case of vertical division of labour (Stiglitz, 1951). We thus have a resource interpretation of the process first alluded to by Adam Smith, in his theorem proposing that the division of labour and its beneficial effects is limited by the extent of the market.

Sometimes the required further specialization is not achieved, and the economic performance of a group of firms is thereby degraded. This has occurred over and over again as industrial districts wax and wane. The district of Okayama, in western Japan, for example, became a flourishing centre of production of varied kinds of farm engines in the 1950s and 1960s, as Japan's farmers moved en masse to mechanize their operations. They needed one engine only per farm, to drive pumps, tractors, or threshing machines. Over 30 manufacturing firms arose in the Okayama district to service this need, producing small, light engines of variable but low horsepower to a variety of end-specifications, for distribution by specialized distributors throughout Japan. But nothing remains of this district today. It was wiped out by the rise of mass producing firms in Tokyo and other metropolitan centres, who were much more vertically integrated and connected to lengthy subcontracting chains than were the small Okayama producers who encapsulated all the technical capabilities needed to produce an engine in one small firm. As new kinds of engines appeared, such as faster and lighter machines, the small self-contained producers of Okayama found themselves unable to switch from being self-sufficient producers to specialized parts of a longer production chain. The longer metropolitan production chains, which encouraged specialized mass producers, therefore wiped them out (Tokumaru, 1998).

From the resource perspective, these Okayama producers were not able to make the breakthrough from self-sufficiency in resources to a new configuration where some resources are shared between firms. There was apparently no mechanism in this case to shift the cluster of firms to a new configuration. Successful clusters of firms, such as in a Silicon Valley, are able to make these configuration shifts; others stay "locked in" to a particular configuration and decline. The issue is how such shifts are accomplished, and whether they call for specific institutional interventions, or are accomplished by the actors themselves.

7.2 Clusters

One obvious way to impose an organizational configuration on economic activities, beyond encapsulating them within individual firms, is to cluster them, in local communities of firms specializing in closely complementary activities. These entities all entail an organizational structure between firms as opposed to one that holds within firms. Clusters of this form are well recognized and indeed are becoming the object of increasing attention – due to the outstanding success of such high tech clusters as Silicon Valley in the USA, and other science-driven clusters like

made available by an increase in the scale of a particular economic activity [lead] ... to a change in industrial structure, those stages exhibiting the greatest scale economies becoming the business of specialist suppliers."

Research Triangle Park in North Carolina, or the Hsinchu district in Taiwan where all the country's major IT and semiconductor activities are co-located.²⁸ It is widely recognized that the success of a Silicon Valley owes much to highly specialized complementarities that are closely co-located – something that cannot be accounted for in simple capital and labour terms in a production function.

Now from a resource perspective there is a clear interpretation to be offered for the phenomenon of clustering, which is that clusters constitute a form of economic organization where resources are shared between firms locally. The two operative words are *shared*, and *local*. Resources can be utilized by more than one firm – this is the very point of adopting a resource perspective on the economy (as opposed to the usual perspective which treats the firm on its own). Resources such as specialized manufacturing knowledge and technical capabilities can be shared in the form of a common “culture” of excellence and leading edge technical intelligence – where the latest developments are exchanged in cafes and meeting points, in workshops and seminars, and through rapid job-hopping, as in Silicon Valley. These are all ways in which one might describe resources as being “in the air” to adapt Marshall's telling phrase. But they are also local. Other forms of shared resource do not have to be local – as in worldwide R&D collaborative structures for example. But the point of the cluster is that it draws benefits from resources shared between firms that are closely co-located.²⁹

Local sharing of resources in clusters can then be expected to improve economic performance, as numerous historical and contemporary examples attest. But again organizational configuration of resources holds the key. Not all locally clustered firms thrive economically. There are many examples of industrial districts, for example, which have declined, not because of poor management or technical capabilities, but because of their inability to adjust to changing external economic circumstances.³⁰ They were “locked in” to one particular kind of organizational configuration (of resources). And when economic circumstances changed, and this proved to be a sub-optimal configuration, they were unable to pull themselves spontaneously into a new configuration. This has happened on countless occasions as industrial districts have flourished for a time but have eventually declined as external economic circumstances changed – as in the Japanese case of Okayama.

²⁸ See Porter (1998) for a recent discussion, Dyer and Singh (1998) for sources of “relational advantage” between firms, and Martin (1999) for a review of cluster-focused geographical economic studies. On clustering as a source of success in Taiwan and Singapore, see Mathews (1997a, 1999, 2001c) and Mathews and Cho (2000).

²⁹ See Foss and Eriksen (1995), Foss (1996, 1999) or Best (1999) for a discussion of this phenomenon in an explicitly resource-based context, and Lawson (1999) for a similar argument extending the “competence perspective” from the individual firm to the region. Schmitz (1999) adds the point that firms in industrial districts develop collective action through conscious intervention, as in the formation of consortia.

³⁰ See for example the study of the Italian footwear industrial districts of Fusignano and San Mauro Pascoli by Nuti and Cainelli (1996).

7.3 *Non-local resource sharing*

Non-local forms of organization, where again resources are shared, tend to be more successful in adapting to new circumstances and changing their form – or rather, they organize for shorter periods, and break up and re-organize as circumstances and opportunities change. Consider the case of R&D consortia, fashioned through private initiative or through public policy. Again from a resource perspective, the rationale and source of success is clear: it is through managed sharing of resources. Firms participate in such consortia in order to acquire access to knowledge and techniques which would be too difficult or expensive for each to acquire individually. But the consortium can allow Smith's division of labour to operate. Each firm or group of firms can specialize in certain aspects of a problem, while the consortium as a whole pools the results for the benefit of all – as in the case of Taiwan's R&D consortia (Mathews, 2001c).

It is important to stress that these resource configurations usually span firms – in “development blocks” or “technological systems” or “systems of tight linkages” or “national systems of innovation” - and call for supra-firm modes of organization that facilitate the sharing of resources.³¹ There is a recursive feature to this process of resource encapsulation – from small groups of resources encapsulated within a small firm to capture synergies, to larger encapsulations within larger or divisionalized firms, and culminating in encapsulations in clusters, networks, alliances, or national systems. In each case the driving factor is encapsulation into a resource agglomeration that has an “identity” and a capacity for self-action, or adaptation.³² They can be agglomerated through the expression of “market forces” or through deliberate, policy-guided action, as in the formation of numerous consortia and alliances. It is the heterogeneity of such resource aggregations that lies at the heart of national competitive systems, just as it is the heterogeneity of resource clusters within firms which accounts for their firm-level competitive advantage. And it is the capacity of an economy to form such resource configurations, and to adapt them as circumstances change, that constitutes what might be called “economic learning” – a notion that makes no sense in mainstream equilibrium analysis.³³

The key organizational insight is that economic performance is not optimized by simply looking to optimize the performance of each productive resource, on its own. The organizational dimension is essential in order to deal with the issue of coordination. The organizational dimension operates at several different levels –

³¹ On development blocks, see Dahmen (1989); on technological systems, see Carlsson and Stankiewicz (1991) and the contributions to Carlsson (1997); on “systems of tight linkages” see Cohen and Zysman (1987). Foss (1996) refers to all these forms of industrial organization as operating at the meso level – between the firm and the national industry. On national systems of innovation, see Lundvall (1988, 1992); this concept spans firms as well as supporting institutions such as public R&D laboratories. From the resource perspective, these concepts all embody the notion of resources held in common and shared within a specified group of firms and institutions.

³² A useful analogy is an Object-Oriented software system, where the software “objects” are the elemental units, and larger programs are built through encapsulated systems of interacting objects. Such analogies are discussed in Mathews (1996a,b).

³³ See Lundvall and Johnson (1994) for a discussion of the concept of the learning economy; Mathews (1996c, 2000) gives an account of the organizational underpinnings of economic learning.

bundling resources in firms to capture synergies, and then connecting firms with each other to capture further synergies, and groups of firms with other groups of firms to capture further synergies again. These are what may be called the “organizational” sources of performance enhancement in the resource economy. This is the starting point for a resource-based approach to value creation and wealth generation in wider economic systems.

8 Concluding remarks

The claim to novelty in the preceding exposition lies not so much in the parts (where existing ideas are taken over and transmuted into resource equivalents) as in the whole. It represents a synthesis of non-neoclassical concerns, ranging from firm growth through competitive and evolutionary dynamics to the organization of industry, where the connecting thread is provided by the elemental category of “resource.” But this synthesis would be of no more than passing interest, if it did not generate fresh insights. I have sought to demonstrate these, such as the account of incumbent-challenger competitive interactions, and the translation of Schumpeter’s insights into resource-based terms. The advantages of such a synthesis can be enumerated briefly. First, it provides a unifying thread linking various disparate areas of economic and management investigation, such as in evolutionary economics, the RBV, and entrepreneurship; second, it offers a coherent interpretation of the totality of resources as the “resource economy”; third, it links with the processes of corporate acquisition and divestment that are described every day in the business pages of the newspaper; fourth, it provides fresh empirical challenges for economics; and fifth, it opens up new and challenging fields such as explaining the continuing relevance of clusters (like Silicon Valley) and even the very latest Internet phenomena.³⁴ There is therefore suggestive evidence that it may be worthwhile to pursue the notion of the “resource economy” as a unifying and empirically rewarding field of inquiry.

What is novel is the category of the “resource economy” as something distinct from the mainstream goods and services economy and labour economy of neo-classical analysis. Everything covered in the mainstream analysis of the goods and services economy continues as before; it is undisturbed by the present analysis. It is complemented by the analysis of the RBV, directed towards the hitherto unnamed “resource economy.” The approach of the RBV is quite distinctive in that it is dynamic and evolutionary; it is descriptive rather than analytical, and concerned with accounting for outcomes in terms of processes. It is concerned with differences, and with how these drive evolutionary dynamics and overall economic performance. It is the private opinion of this author that in time these approaches will come to dominate the analysis of the “goods and services” economy as well, by which time the obsession with formalistic static equilibrium analysis will just be a bad memory. But for the moment all we need claim is that these evolutionary-oriented approaches are “tailor-made” for the resource economy.

³⁴ Amit and Zott (2001) provide an original adaptation of the RBV and entrepreneurial studies to the case of Internet-based firms, that is close in spirit to the account presented here.

The resource economy as a totality provides the setting for observing numerous parallels and analogies that would otherwise remain obscure. Note the strong analogy for example between the disequilibria in resource combinations that can be held to drive entrepreneurial interventions, at the level of the economy, with the resource disequilibria that can be held to drive managerial interventions at the level of the firm. In the one case, it is entrepreneurs recognizing a disequilibrium in the goods and services market (such as a clear shortage of some kind of intermediate good) and responding to reconfigure resources, while in the other case it is managers recognizing a “slackness” in the resource base of their firm and responding with a strategy of diversification or new market entry to take up the slack. Entrepreneurs create new resource combinations, while managers within firms can utilize the resource combinations they are given to create new sets of goods and services. They are both working within resource “constraints” and opportunities that derive their rationality from the resource economy – a rationality that is hidden from view if the goods and services economy is the sole object of attention.

This paper seeks only to sketch what an analysis of the “resource economy” might look like, and how it might complement the kinds of analysis subsumed under the rubric of the neoclassical synthesis. The case is made that the project is at least plausible and probably feasible. It has the merit that it is empirically oriented, and if taken up, will encourage empirical investigations of competitive resource dynamics, evolutionary resource dynamics, pathways and adaptations, and many other phenomena that the neoclassical synthesis ignores. This goes to the heart of the critique of the neoclassical synthesis, which is not so much that it is wrong, as that it discourages any kind of empirical inquiry – given that all interesting questions are settled in advance. In the resource economy, everything has to be settled by testing claims against reality. This might be a good foundation for an economics suited to the 21st century.

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