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Industrial districts as organizational environments: resources, networks and structures

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Abstract:

The paper combines economic and sociological perspectives on organizations in order to gain a better understanding of the forces shaping the structures of industrial districts (IDs) and the organizations of which they are constituted. To effect the combination , the resource based view (RBV) and resource dependency theory are combined to explain the evolution of different industry structures. The paper thus extends work by Toms and Filatotchev by spatializing consideration of resource distribution and resource dependence. The paper has important implications for conventional interpretations in the fields of business and organizational history and for the main areas of theory hitherto considered separately, particularly the Chandlerian model of corporate hierarchy as contrasted with the alternative of clusters of small firms coordinated by networks.

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Key words:

clustering, dynamics, resource-based views, resource dependency.

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Introduction

Industrial districts (IDs) present the researcher with a particular organizational environment – or a particular way of organizing economic activity – in which geographical clustering is just the first step in embedding of firms in their institutional context. In 1995 Jonathon Zeitlin asked 'why are there no industrial districts in England?'. Whatever its accuracy, the question is revealing in so far as the English industrial landscape once was populated by many industrial districts (Wilson and Popp, 2003). The numerous districts of the nineteenth-century have tracked many different paths, from total extinction, through mutation to, despite Zeitlin's question, persistence. Clearly, industrial districts are sites of powerful processes of change. We see this even if we turn to the 'homeland' of the industrial district in the late twentieth-century, Italy, where the continuing evolution of districts is eroding characteristics once thought of as central to the 'canonical' definition (Rinaldi, 2005). What processes are at work as districts evolve, change and, in some cases, die, and how, in each case, are those changes manifested?

Recognizing that in industrial districts the social and the economic are inextricably linked – that is, that the term implies not simply a particular way of organizing economic activity, but also the achievement of that within particular social arrangements – the paper seeks to explore these questions by combining both economic and sociological perspectives on organizations. We can see the need for this synthesis, and the direction in which it should be focused, more clearly through reference to apparently conflicting literatures in industrial history; the 'Chandlerian' and the post-Fordist/flexible specialization, which both tell stories, if very different ones, about the distribution and coordination of resources across the economy. The Chandlerian narrative (1962; 1977; 1990), if we may call it that, is highly economistic in thrust and is predicated on the assumed *logic* of a *progressive* internalization of resources within the managerial corporation. It is the internalization of resources within the firm, necessarily accompanied

by their coordination through hierarchy, that is the key to the Chandlerian thesis. The flexible specialization literature, on the other hand, both recognizes the possibility and the actual existence of *alternatives* in which resources are widely distributed across many organizations and in which the recombination, or coordination, of those resources is determined not simply at the level of the individual organization, but also at that of a wider institutional context. Thus, this paper focuses on the resource bases and the resources dependencies of both firms and districts and on how these interact with each other and further drivers to shape the dynamic processes at work in districts. In doing so, we build on Toms and Filatotchev's (2004) framework for the exploration of the dynamic linkages between governance, strategy and networks. This approach draws explicitly on resource based views (RBV) of the firm and resource dependency (RD) theory. However, in making this attempt in the context of industrial districts we also seek to extend the Toms/Filatotchev model. Industrial districts are defined in the first instance by their spatiality, specifically their spatial concentration. Thus we will consider how spatiality impacts on the important elements of the Toms/Filatotchev model, particularly in terms of the (spatial) distribution of resources and the (spatial) construction of governance structures. In short, just as resources have both physical and organizational 'locations', so governance arrangements are not aspatial. Some of the underlying principles of our broad approach do require, however, some discussion.

First, we must consider whether the assumption that, both theoretically and empirically, the Chandlerian and flexible specialization literatures represent two distinct schools with regard to economic growth and development and, if so, whether this represents a barrier to our understanding of the processes at work. Each literature draws tight correlations between corporate structures and forms and alternative models of capitalistic accumulation, namely, mass-production and flexible specialization. Both, whether explicitly or not, portray these models as dichotomous and mutually exclusive. Sabel and Zeitlin (1985) entitled a seminal article 'historical alternatives to mass production'. More recently Scranton cast his *Endless Novelty* as being about "[an]other side" of the Second Industrial Revolution' that created 'technological and organizational transformations *distinct* from, but comparably significant to, the creation of routinized assembly, bureaucratic management, and oligopolistic competition' (1997: 3). Thus, on

the one hand, the Chandlerian model, in which scale and scope economies are internalised in the large multidivisional firms of managerial capitalism, is most commonly associated with the new industries of the Second Industrial Revolution characterized by standardization and high throughput. On the other, clustering is equated with a small-firm economy of flexibility, reliance upon resource sharing external to the individual firm and personal regimes of ownership and management. Structural and strategic trajectories are assumed to be quite different. But history and observation teach us that these exclusive differences are not tenable; districts coalesce into corporations or come to be dominated by large leader firms, corporations fragment into much more distributed systems, and in each case both the distribution and coordination of resources are reordered. Hence our desire to attempt a reconciliation of two apparently different traditions in writing about managerial and organizational history.

Ontologically, our chosen theoretical tools, RBV and RD, also come from very different traditions: RBV derives from economics, with its associated biases towards positivism, rationality and methodological individualism, while RD owes more to sociology. However, we believe, and will attempt to show, that the two, in combination, can shed a more revealing light on both the distribution *and* the use of resources across the economy. Indeed, we would claim that both perspectives are needed.

More specifically , as already indicated, our focus is the dynamics of clustering, and transitions from one structure to another. Particular variables include the numbers of firms present in a district and their size distribution, the diversity of the activities which they undertake and the balance they strike between internalization and externalization, and hence the routes they take to the realization of economies of scale and scope. These foci must however, be accompanied by a concern for the architectures of governance with which different patterns of resource distribution are associated. These range from loose formal networks through associations that span organizations to hierarchical structure , including the interplay between co-operation and competition, allowing for many more possibilities than the dichotomous Chandlerian and district literatures had previously suggested.

The fusion of these perspectives highlights the need also for a brief word on writing organizational history. As the several emphases in the preceding passages suggest, the

two literatures propose very different historiographies. One is almost Whig-like in its emphasis on an ineluctable progress. The other, too, initially seemed to propose a parallel and equally ineluctable, if unrealized, alternative progress. I Its later expressions increasingly encompass the multiplicity and mutability of possibilities, their contingency and path-dependence, and their subtle relationship with actors (Sabel and Zeitlin, 1997). Thus, we also wish to situate this synthesis within a perspective that is not merely historically sensitive but historically driven. As historians we do not deploy references to history simply as 'context' but see history as *process*, which, through the operation of forces such as path-dependence and contingency, plays a central role in the stories we wish to tell. History provides a dynamic test-bed for theories derived from the social sciences.

The paper will be structured in the following way. First we will isolate more clearly some of the conceptual gaps we hope to address before discussing in greater depth the theoretical tools that we intend to deploy. We will then present a synthesis through which it is possible to explore the dynamic interaction of resource bases and resource dependencies in the context of the ID and the outcomes of those interactions in terms of the various structural properties of districts. We will then move to an examination of the drivers behind the interactions explored above. Finally, before concluding, we will return to historiographical issues by indicating how resource bases and resource dependencies are co-determining over historical time.

Isolating the problem

How are the linkages between resource bases and resource dependence, or governance, widely defined, currently conceptualized, with regard to both corporations and districts? One approach emphasises how governance factors consist of arrangements for constraining managerial opportunism in a principal-agent framework. They include monitoring by boards of directors and mutual monitoring by managers (Fama and Jensen

1983; Rediker and Seth 1995) and by large outside shareholders (Demsetz and Lehn 1985), and equity-based managerial incentives that align the interests of agents and principals (Murphy 1985). Monitoring is facilitated by the communication of information contained in financial reports and their scrutiny by processes of audit (Jensen and Meckling 1976; Watts and Zimmerman 1986). External factors, such as the threat of take-over (; Shleifer and Vishny 1997), product competition (; Jensen 1993), and managerial labour markets (Fama 1980) may constrain managerial opportunism. At the same time, governance and accountability have also been neglected, or left unresolved, in the dominant Chandlerian paradigm (Toms and Wilson, 2003).

However, a broader definition of governance is required than that implied in the principal-agent literature. As suggested above, whilst governance is about managerial accountability to shareholder principals, it might also be concerned with processes that facilitate managerial entrepreneurship, so that shareholders benefit from appropriate opportunities (Keasey and Wright 1993; Tricker 1984). Such activities might include downsizing and divestment in response to changes in governance (Toms and Wright, 2002). The issue of governance has also similarly preoccupied the clustering literature. Best argues that the technological dynamism of the 'entrepreneurial firm' is translated into technological dynamism at the level of the district via the 'collective entrepreneurial firm' defined as a 'self-organizing agent for change composed of networked groups of mutually adjusting enterprises' (2001: 83). Thus, district dynamics are also dependent on governance forms and arrangements, with externalization dependent on the *co-ordination* of interdependent but institutionally dispersed resources. Previous research has conceptualized networks as modes of organizing inter-firm activities through coordination and cooperation (Grandori and Soda 1995: 184; Toms and Filatotchev, 2004), an approach extended to districts in the present paper.

The agency perspective that dominates organisational economics and corporate governance theory (Dalton et al. 2003; Fama 1980; Jensen 1993, Hart 1995) also has obvious limitations when extended beyond the simple principal-agent relationship, specifically when applied to districts, where lateral linkages tend to prevail. The literature on districts using transaction cost approaches, meanwhile, concentrates only on these lateral linkages, contrasting for example districts dominated by one buyer or seller with

districts where decision making is more dispersed (Belussi 1999; Hemmert 1999; De Propris, 2001). Similarly, the sociologically orientated literature also concentrates on these lateral relationships. From the 'strong embeddedness' perspective (Granovetter 1992: 5; Piore and Sabel 1984; Sabel and Zeitlin 1985; Staber et al. 1996), the function of governance systems in the ideal/typical industrial district is to maintain a creative balance between co-operation and competition. Whilst the approach is normative, like the more positivist transaction cost approaches, the emphasis is on the horizontal policing arrangement within the district.

A very important, though often only implicit, element of sociological approaches is the effect of spatial proximity. Spatial proximity of actors in IDs is held to impact positively on the structure, operation and effectiveness of networks as governance arrangements. As Staber notes, the 'embeddedness of firms in a distinctive local social fabric is a key feature of the industrial district model' (1996: 148). This deep embedding of actors in 'local social milieu' directly impacts behaviours because the 'milieu reflects cultural values and shared beliefs about the form and pattern of economic exchange. The firms in a district are expected to balance their commitment to collective purposes with their own, more specialized objectives' (1996: 148). Proximity works not only through the effects of socialization (Sabel and Zeitlin, 1985) and through the sharing of socio-cultural attributes, from family ties and political and religious affiliations (Paniccia, 2002), which work to enhance trust and co-operation, but also through facilitation of repeated face-to-face interactions. Networks as governance mechanisms in IDs thus emerge and function somewhat naturally as a result of spatial proximity. They allow, amongst other things, for heightened levels of trust and cooperation between actors, ease of monitoring and sanctioning of behaviours (Casson, 2003), facilitating more effective transmission of tacit knowledge and information (Breschi and Lissoni, 2001). Networks as governance mechanisms thus have a (physical) span of control. Thus, we might expect to find network connections, and hence governance interactions, densest at the local level. Long-distance networks will be constructed differently and will lack the social underpinnings that are derived from proximity in IDs (Casson, 2003). Arising less spontaneously they will often require conscious construction and thus also are likely to be directed to more instrumental ends. These differences mean that local networks will not

always serve as good foundations for the construction of long-distance networks. These claims have obvious implications when applied to a framework that considers both the spatial and organizational distribution of resources.

It is the purpose of this paper, therefore, to offer a synthesis between the vertical relationships incorporated by governance-based principal agent theory and the lateral relationships suggested by the economics of clustering. As this brief review suggests, it is perhaps through the integration of vertical governance and accountability structures with the lateral determinants of competitive and collaborative industry structure that such a reconciliation might be achieved. The objective is to use the mechanisms of governance and accountability, rooted in resource dependency theory, to explain contrasting outcomes in hierarchies, districts and hybrid organizational forms and processes of industrial transformation.

In order to do this the paper develops an analytical model to explain industry structure and dynamics. Horizontal structure dynamics are explained using the resource based view (RBV) of the firm. The RBV is useful because as a theory of firm-level behaviour it equates competitive advantage based on the possession of unique or difficult-to-replicate assets. Such assets might explain the presence of dominant firms on the one hand, or, on the other, where scale-based entry barriers prevent their creation by a single firm, helping to explain the emergence of co-operative resource-sharing structures. Vertical dynamics are explained by capital dependency theory (Prechel, 2000; Zey and Swenson), as a special case of resource dependency so that the presence of vertical monitoring arrangements is a function of the degree of such dependence. By separating out capital dependence, other resources, such as raw materials and human capital, are treated as endogenous. Endogeneity acknowledges that pools of these resources arise as a function of past activity, often within the district. Capital dependency emphasises accountability mechanisms in terms of governance factors such as ownership structure, roles of corporate boards, financial communication and outside investors. Where firms in a district experience differing levels of dependence, there will be differences in the distribution of power. Both RBV and the capital dependency theory are useful in a dynamic perspective as resources are inevitably subject to time-based variations of technology and demand conditions inducing product life-cycle constraints. While both

are well established in the strategic management literature, there have been relatively few attempts to synthesise them, least of all in a dynamic historical perspective (Toms and Filatotchev 2004). This paper extends the Toms and Filatotchev dynamic resource-governance model incorporating the spatiality of IDs.

In summary, the principal outstanding task for the clustering research agenda is to consider resource location and the sources of internal and external economies of scale and scope and to incorporate vertical governance and accountability perspectives. This is consistent with the broader implications of the paper, which is to synthesise the RBV literature with work on capital dependency to explain the historical development of different industry structures. In so doing, the paper also aims to fulfil its fundamental aim of highlighting the potential linkages between the Chandlerian and district paradigms, reconceptualizing these not as mutually exclusive but as existing on interacting continua. If successful, there are important implications for the Chandlerian view, which has retained much of its influence as a dominant paradigm in both management theory and business history (Whittington et al. 1999; Whittington and Mayer 2000), as well as for the institutional and neo-classical views of industrial organization.

Resource distribution, capital dependency and industrial organization

This section aims to synthesize two literatures that assist our understanding of industry organization, including in this context both structural characteristics and governance arrangements. Governance arrangements refer to the mechanisms whereby organization and network members are held accountable to each other and to external resource providers. These definitions are used so that the two main areas of theory, the RBV and resource dependency theory, can be accommodated into a single model. To begin with, the contribution of each area is outlined.

The RBV concentrates on difficult-to-replicate, firm-specific assets that promote competitive advantage. Such resources might include specialized production facilities, trade secrets and engineering experience (Teece et al. 1997) and firm-specific idiosyncratic knowledge assets (Castanias and Helfat 2001). In the RBV, such firm-specific factors are traditionally considered as the major drivers of strategic change

(Barney 1991, 1997). According to this view, managerial and entrepreneurial resources drive growth and diversification (Whittington and Mayer 2000). The RBV has been extended to the competence-based theory of the firm in which the firm constructs capabilities through internal learning processes (Teece et al. 1997). Where these resources are utilised effectively, competitive advantage is achieved through delivering value to the customer, in the form of improved products or lower prices (Barney 1986; Peteraf 1993).

A weakness of the RBV is that it says relatively little about resources that are not shared by firms. Extensions to the RBV deal with rents in factor markets (Barney, 1986) and rents arising from spatial location (Lippman and Rumelt, 2003), but there has been no direct analysis of competitive advantage at the level of the district. Even so,, as the literatures on clustering and networking suggest, resource-sharing arrangements may also promote competitive advantage (Arthur 1990). As Mathews notes, citing Silicon Valley, in 'the real economy' firms are often 'placed in positions of mutual dependence,' because resources 'usually span firms' (2003: 128, 133). As sharing arrangements within districts frequently involve the transmission of tacit knowledge and innovation 'spill over' the configuration of non-firm specific assets can have a major impact on strategy and structure, highlighting the importance of governance systems as proximate communication channels. Swann et al. 1998; Jaffe 1989; Feldman 1994). Extending Marshallian perspectives, dynamic external economies of scale occur where there are accumulations of local knowledge as a result of repeated interactions along established channels (Glaeser et al. 1992). According to this view, clustering of firms in industrial districts, trade associations and other networked organizations may be promoted through sharing trade secrets and drawing on local pools of experience and skilled labour (Amin and Thrift 1994). These shared resources form the basis of agglomeration-based external economies of scale (Kamien et al. 1992). In summary, the RBV requires extension so that competitive advantage is a function of resource acquisition, however accessed. The RBV should consider the location of resources, inside and outside the firm, in order to explain the full range of possibilities for industrial organization and associated governance arrangements.

Another perspective allowing such an extension is the suggestion that mass production and flexible specialisation lie at opposite ends of a continuum. In industrial organisation terms, this is the equivalent of the trade-off between scale economies and allocative efficiency (Oughton and Whittam 1997: 6). Internalisation of production in large-scale units creates scale-related, cost-reduction benefits to customers on the one hand, whilst on the other there are the incentive and price reduction customer benefits associated with the absence of market power. It might be added that in the former case there are few benefits from clustering, since the necessary resources are internalised within the firm through integration, whilst diversification requires product and market dispersion. Only in relatively competitive and geographically proximate industries are there likely to be external economies of scale benefits from clustering.

However, these performance benefits have been analysed without reference to the governance of districts, which is another important dimension potentially explaining their dynamic development. Resource dependence theory assumes that firms respond to external pressures, but their power relative to these pressures may be contingent on the configuration of the resource-user/resource-provider relationships (Pfeffer 1992, 1997; Frooman 1999). Capital dependency, as a specific case of resource dependency, is therefore important because it influences the degree to which the district is externally monitored and thus the extent governance arrangements can or cannot draw on localized foundations. Where the district is relatively self-sufficient, there is little incentive to subject the district to the scrutiny of external monitors. In turn, resource dependency reflects the growth rate of the industry. In rapidly expanding or evolving industries, it is entirely probable that the district will require outside resources in order to finance and produce the required asset base. In this instance local networks are unlikely suffice as instruments for acquiring resources. Conversely, in contracting industries the reduction of dependency will have the effect of making districts more difficult to police from outside, whilst the district members may use their internal networking arrangements to promote capacity sharing, output and price restrictions and other related strategies. Here, in contrast to much of the embeddedness literature, proximity can prove a liability, with districts becoming increasingly inward-looking (Cookson 2003).

These and similar strategic actions formulated by the district members are likely to be a result of the dynamic interaction of the resource availability and resource dependency characteristics of the district. Where external stakeholders provide resources, it is necessary to put in place arrangements for co-ordination and monitoring to mitigate opportunistic behaviour by network members (Gulati et al. 2000; Jones et al. 1997). Such accountability processes emphasize information flow, as well as offering a broader perspective than the Chandlerian view of technology as the exploitation of associated scale and scope economies (Casson 1997; Hamilton and Feenstra 1995; Langlois and Robertson 1995).

Thus, Piore notes how successful district governance requires that the 'economies that are external to particular productive units be internalized as parameters for some higher-level organization decision-making unit' (1992: 437). However, he also goes on to argue that as this higher-level function cannot be fulfilled by the market, then, for example, the 'relationships … organized by contracts' recorded by Marshall meant that he 'did not observe industrial districts' in the sense understood by contemporary network scholars (Piore 1992: 437). Whilst this point might be contentious, it is nonetheless indicative of how, in districts, contracts are incomplete, and openness and secrecy depend on patterns of control through agency and delegation (White 1992: 93).

At the same time, evolutionary economics suggests that the interaction of governance arrangements and resources may be intricately linked with and central to the development of new and existing capabilities. Increasing emphasis is now being placed on 'patterns of institutedness, the nature of the rules, practices and procedures that maintain and modify institutionalized relationships…that give *distributed* innovation processes their stability. They … provide the frameworks for generating and *combining* knowledge' (Metcalfe 2001: 577). It is through such processes that there emerge fresh possibilities (Metcalfe 2001). As the added emphases suggest, these arguments are as applicable at the level of the district as they are at that of the firm. Such arguments also inject further dynamism into the district by, at least partially, making the rate of growth a function of technological change and a property or outcome of the district as a system of resources and attendant capabilities.

In making this point, we endogenize technological change as a factor in our model, if only partially. However, it is worth noting that, for analytical purposes, we take technology and resource bases as a given *at any particular point in time*, such as the point from which a process of transition in industry structure begins. Further, not only is technology both dynamic and partially endogenous, it exists in a complex interplay with products and markets. We acknowledge this and with it that entrepreneurs will actively attempt to reshape both products and markets in ways that are favourable. However, without evading these complexities, we again note how in analytical terms our principal focus is on the mechanisms mediating dynamics rather than the forces giving rise to them.

The importance of the interaction of governance arrangements and resource distribution might be most acute in relation to intangible assets, particularly those 'untraded interdependencies' described as attaching to 'the process of economic and organizational learning and co-ordination' (Storper 1997: 21). For Marshall (1919) these are those 'mysteries of trade' that are to be found somehow 'in the air', but nonetheless according to the RBV form the source of competitive advantage only for the individual firm. For the purposes of the model presented below, where resource pools are external, for example a trained workforce or a local transport infrastructure, they arise from previous firm-specific investments in resources aimed at securing competitive advantage for that firm, but now transformed into past (sunk) costs. These sunk costs nonetheless remain assets from the perspective of the district. Amongst groups of firms, where direct contracting is difficult the circulation and distribution of resources has to be achieved via other means, for example, by sharing the costs of generic training. From this perspective, 'relational assets', such as networks, become vital. But the natural spatial limits to trust ensure that networks may also restrict access to such scarce resources (Cookson 2003; Toms and Filatotchev 2004). As Breschi and Lissoni argue, if 'epistemic communities' will not disclose their 'common codebooks' then they have the power to act in highly 'exclusionary' ways (2001: 989). These contrasting outcomes stress the need for a more structured view of governance arrangements in districts.

In sum, casual awareness of the empirical record must throw elements of the Marshallian model, and its more recent manifestations, into doubt. In particular, the

literature has too little to say about the impact of the heterogeneity of the positions occupied by different actors in the business structures of districted industries. The size of firms and their structural positions, in terms of both vertical and horizontal linkages, their relative power, and the spatiality of their network connections (are they primarily short rather than long-distance, for example?), all influence access to and utilization of resources and hence the challenges of allocation and co-ordination facing entrepreneurs and managers. These challenges in turn shape priorities, interests, attitudes and behaviours within and beyond firm 'boundaries'. These arguments suggest the need for a framework capable of capturing the joint impact of governance and resource issues on district organization and characteristics.

A proposed synthesis

According to Toms and Filatotchev, ownership and governance structures, allied to perspectives on the strategic resource content of business activities, in which 'managerial and entrepreneurial resources drive growth and diversification' form 'an important context that moderates strategic response' in periods of both growth and crisis (2003: 70, 69). Conceptualizing governance in terms of accountability (from transparent to opaque) and the resource base of the firm as either narrow or extensive, Toms and Filatotchev capture the characteristics of networks with a matrix. In this model 'the degree of transparency will be a function of the degree of dependency on external stakeholders for resources' (2003: 71). Here, resource dependency is linked to the industry growth rate as a function of technological change and regulatory environment, and thereby 'impacts on the social construction of networks' as a governance mechanism, a construction that also takes place in a spatial context. Technology and the location of productive resources also impact on the necessity for and ability of firms to internalize resources, or, conversely, how successful they are in constructing and maintaining effective trust-based networks. The latter is typically believed to be easiest at the local level. A high dependence on resources external to the district itself may demand the creation of quite different linkages.

The major simplification in this approach is that it does not accommodate separate resource ownership and governance functions at the level of the network as well as at the level of the individual firm. Although the present synthesis builds on the Toms and Filatotchev (2003, 2004) model, it also extends it by exploring the interdependency of governance structures and scale and scope economies in districts, emphasising the multi-level nature of both governance arrangements and patterns of resource distribution and dependency, and their spatiality. In other words, overlapping governance structures exist at the level of the firm and the district, whilst resource bases and dependency at the level of the firm must be situated in relation to resource distribution and dependency at the level of the district. Moreover, it is district-level governance arrangements that integrate firm-level resource bases and district-level resource distribution and dependency and proximity lends these district-level governance arrangements alternative qualities to those operating at different geographical scales. The balance between internalization and externalization of scale and scope economies is an expression of the interdependency of governance and resource issues for both firms and districts. Incorporation of the resource base with capital dependency facilitates simultaneous consideration of transaction costs and agency costs as 'information costs' in the context of organizational evolution, with information costs being lower amongst actors operating in close spatial proximity (Casson 1997). To summarize, if the characteristics of districts are to be contrasted across industry and through history, then the degree of internalization of resources and the degree of resource dependency and transparency to external monitoring are likely to be important determinants of district characteristics.

The proposed general relationships between resource bases and resource dependence are set out in Figure 1. As Figure 1 suggests, the characteristics of districts, and by extension other forms of industry structure, can be ascertained with reference to two characteristics. First, there is the *ex ante* resource base, the tangibility or intangibility of those resources, and their geographical location. We will address later how taking resource bases as *ex ante* needs to be problematized in order to reach a formulation that is historiographically satisfying. The resource base refers first of all to the resource bases of the individual firms that comprise the district. Examples of tangible resources include production capacity or local raw material sources, whereas intangible refers to R&D

expertise and local pools of knowledge assets. However, the resource bases of individual firms may, of course, also have implications for the breadth of the resource base of the district as whole. A district with a resource base that is in aggregate relatively narrow, for example, where wide firm resource bases lead to considerable replication of resources from firm to firm, will be more dependent on providers of external resources.

This note directs out attention towards the issue of resource dependence. Resource dependency meanwhile refers both to the degree of dependence district members have on each other and to the degree of dependence of all district members in the aggregate upon resource providers that are external to the district and are thus spatially distanced. Important external resources include primarily but, not only, financial capital and may extend to include political capital or information such as that relating to markets or technologies.

The dependent variables of the model in the figure are the district characteristics. These include major structural characteristics such as firm-level specialization, diversity of activities between firms and firm-size disparities. From these will flow other dependent variables, including institutional arrangements, market micro-structure, characteristics of entrepreneurs, labour relations, competitive advantage, internal accounting arrangements, and so on.

Figure 1 about here

We can now sketch some of the broad relations between configurations of resource bases and resource dependencies, and hence the structural, strategic and governance characteristics of districts. Firstly, where firms have relatively narrow, that is specialized, resource bases, we can expect an accompanying specialization in economic activities. This specialization at the level of the firm suggests a relatively high degree of diversity between firms, in terms of the activities they perform, often accompanied by relatively low levels of size disparity between them. Firms, being more specialized, are also likely to be many and small. What are the governance implications of such an arrangement of resource bases?

To a large extent this will depend also on resource dependence of the district in aggregate and within the district. Where firms specialise within the value chain and have narrow individual resource bases, the governance challenge will fall on a vertical co-ordinating mechanism. rather than controlling competition, as might be expected in a district that is more horizontally fragmented. District-level governance arrangements, such as networks, and will promote resource sharing though, associational organizations such as those found in the Birmingham Jewellery Quarter (Carnevali, 2003). Where the district is horizontally fragmented, with similar firms such associations might also act to limit competition within the district. Where handled efficiently, this will lead to enhanced entrepreneurial scope through information sharing and cross-fertilisation and will encourage a structural dynamic of spin-offs and start-ups to exploit emerging technological and market niches. These are the sorts of effects that, much of the district literature argues, flow relatively naturally from spatial proximity of actors and the creation of a local social milieu. Governance arrangements, largely in the form of networks, will be founded on dense, highly-localized linkages

These effects will be reinforced if the district also possesses, or is able to generate the majority of the resources most critical to its success, that is, if it is in a position of relatively low external resource dependency, as in quadrant 4. Whilst low growth districts may display relatively low dynamic properties they can still persist and prosper over long periods of time on the basis of an ongoing refinement and reinforcement of its existing capabilities and advantages, a refinement that often occurs through the structural dynamics outlined above. Again, the Birmingham Jewellery Quarter exemplifies many of these processes. In sum, then, if district members are mutually relatively resource dependent but the district is in aggregate capital self-sufficient, equality is promoted within the district through arrangements to share existing resources and is facilitated through the effects of proximity. However, there might still be moral hazard and free-riding problems amongst the relatively equal participant firms and district norms may be enforced through industry associations and agreements on issues such as price fixing. In these conditions, the participants have incentives to share accounting and other types of information, so that costs of production are known and prices can be maintained at levels above production cost or innovations in products or processes rapidly diffused amongst

firms used to working within one another. Other areas of co-operation include training, education and marketing. Despite these high levels of co-operation, such districts may be characteristically decentralised. This set of conditions will lead to districts closest to the classic or 'canonical' district of the so-called Third Italy.

Where individual resource bases remain narrow but, aggregate dependence on external resource providers is high, as in quadrant 1, centralisation is promoted, as the district members need to create a conduit for securing new resources, a task often beyond the dense, localized networks created by narrow firm resource bases. Thus, conditions can pose major governance challenges that conflict with the balance of resource distribution and dependence within the district, where decentralization remains key. We can see this conflict in the Coventry machine tool industry, where lead 'seed-corn' firm Alfred Herbert refused the role of leadership at a national level, stymieing attempts by the industry to develop vital political capital (Lloyd-Jones and Lewis 2003).

However, if an appropriate conduit between the district and external resource providers is found, then one likely effect is to empower the section of the district, perhaps a particular firm, which is delegated responsibility for securing these resources. This may create moral hazard and adverse selection problems within the network, where a single firm acts as agent for the remaining firms (Zaheer and Venkatraman 1995), in addition to the principal-agent relationship between the delegated firm and the resource provider. Accounting and accountability structures must therefore be created which operate in both directions and at a range of spatial scales. Reconciling these contrasting governance arrangements may present a considerable challenge. Internalising the relationships might solve these problems, for example where one firm takes over the other members of the district, as happened in the Widnes chemical industrial district in 1890 with the formation of the United Alkali Company (Popp 2003).

As the resource base is centralized, a single firm takes over an increasing number of functions, for example by buying up other members of the district, thereby internalizing the resource bases of the constituent firm(s). Movement may also occur in the opposite direction through spin-offs and demergers. Such moves would bring about a transition across the matrix, from quadrant 1 to quadrant 2 In industries with extensive resource bases at the level of the firm, a corresponding lack of resource dependence between firms

and high-dependence on external financial resource providers, longer-distance connections attenuate the forces promoting clustering. Further characteristics will include high levels of generalization at the level of the firm, low levels of diversity in activity between firms and low levels of size disparity. The governance challenge becomes that of mitigating competition, effective co-ordination of large and complex resource sets and a powerful voice amongst external providers. In this situation, central management attempts to solve the moral hazard problem by resort to internal planning and management accounting controls, as in M-form structures. Here, the principal responsibility of the corporate centre is raising resources and possibly personnel functions, and distributing them as rationally as possible to the product divisions. Head offices may well migrate to metropolitan locations in order to be close to key external providers, reinforcing our point with regard to the spatiality of governance arrangements. As already noted, forces for clustering are weak under these conditions. Clustering may only emerge or persist as a result of simple economies of agglomeration or because of historic circumstances, such as the position of Widnes chemicals under ICI, or because of the presence of the provider of key idiosyncratic resources, such as a university or other research facility.

Clusters located in quadrant 3, where individual resource bases are extensive but dependence on external resources is low, often face their own particular challenges. Firms will be generalized in their activities and show little diversity amongst themselves. However, under the particular conditions classically associated with clustering, particularly a localization of both physical and human resources, this does not necessarily lead, as it might in other circumstances, to a few relatively large firms existing in an oligopolistic state. Instead, an historically-accrued richness of localized resources promotes a structural dynamic of near uncontrolled entry and wide disparities in firm size. Districts structured in this way can demonstrate that the positive forces associated in the district literature with proximity do not operate with absolute inevitability. The North Staffordshire Potteries experienced just this situation very powerfully in the late nineteenth-century (Popp, 2001).

In governance or resource dependence terms, extensive generalized resource bases mean there is little need to develop extensive, decentralized links or networks between

district members. The effects often ascribed to proximity might thus also be a response to resource distributions, at least in part. The articulation of such districts is primarily horizontal, rather than vertical, and the main challenge becomes that of controlling possibly rampant intra-district competition and the high-levels of entry with which such competition is associated. The Lancashire cotton textile industry also possessed many of these features and such districts may be thought of as closest to the classic 'Marshallian' formulation. However, with little monitoring and oversight from external resource providers and fractured internal governance mechanisms, such districts can often find it difficult to adjust either to radical exogenous shocks or to their own internal dynamics. The accountability structure of the district may include the use of interlocking directorships within a controlling elite, as was seen in Lancashire cotton textiles, that manages a looser hierarchy, through say a holding company or federal structure. However, these structures should not be thought of as akin to the wider networks held to be typical of the canonical Italian district. At best, they may be thought of as 'capsule' networks, that is, they are relatively small in membership, self-contained and impermeable – characteristics that do not promote an outward looking stance.

Drivers

The synthesis as presented thus far is static, however. It is important to ask, therefore, how the processes underlying transitions can be conceptualized? First, interacting dynamics induce movement in particular directions. Thus, the dynamic on the vertical axis is technological change and changes in demand conditions. On the horizontal axis the dynamic includes forces that impact upon the social ownership of firms, such as company law and rules governing financial disclosure and other aspects of corporate governance. As we noted above, however, changes in resource bases, in whatever direction, will alter the degree of resource dependency at the level of the district. Furthermore, because changes can be exogeneous, the rates of change in resource base and governance arrangements may differ.

Forces for change powerful enough to induce transitions across the matrix, whether they originate in the technological realm, in the market, or in other environmental factors, are very often relatively radical and discontinuous. Governance in districts, in contrast, is rooted very often in networks and other related structures (kinship, religion or ethnicity, for example). Effective monitoring and accountability are highly dependent on information, while information costs are in turn heavily influenced by relational structures and properties, including trust, all influenced to varying degrees by spatial effects and proximity in particular. Even as dispersed ownership and more efficient markets for shares emerge, governance arrangements remain socially and spatially embedded (*pace* policies for the recruitment and succession to top management positions to reinforce control). A practical example might include the recovery and maintenance of invested capital to meet outstanding financial claims. Where there are significant surpluses or deficits, resulting from cycle effects, financial crises or other causes, the reordering of such financial claims may be slowed down by legal requirements and vested or conflicting interests. As a socially constructed phenomenon, governance, especially in complex districts, is less likely to experience rapid, discontinuous change. In essence this is an argument for path dependence in governance arrangements. Furthermore, there may also occur what might be thought of as spatial dependence. In other words, a district rich in dense, localized governance connections may be ill-equipped to build the wider span of linkages demanded by an emerging position of dependence on external resource providers. Thus, in periods of structural stress misalignment between resource and governance arrangements is likely to develop. For example the ultimate failure of Lancashire as a cotton district resulted from precisely such a misalignment (Filatotchev and Toms, 2003). Transition towards finding a new position with regard to resource bases and dependencies will only occur to the extent and in the direction allowed by more slowly evolving governance systems.

Further, one must consider the growth rate, which is linked to changes in income and demand conditions and historically to the developmental and innovative propensities of the resource base. If the asset/resource base of the district needs to be modified in response to these changes, the degree of resource dependence increases, with consequences for the spatiality of governance arrangements as we have already indicated.

As Hobson noted over a century ago, 'the art of living must continually change, and each change alters the value attached to the several forms of consumption, and so to the industrial processes engaged in the supply of different utilities' (Hobson 1906: 159). Adjustment to such changed conditions is far from inevitable, because 'the opening out of new sources of supply or new markets for sale may quickly overbear the strength which old districts have inherited from part conditions' (Marshall 1919: 287).

The precise characteristics of the district will depend upon which of these forces are the strongest. For example, the forces of innovation and technical change may be strong, creating high dependence on financial resource providers but which may be inadequate to the task (for example, the capital markets of the industrial revolution, Wilson 1995). The converse can also be true; weak forces of change in the asset base and low technical discovery coexisting with powerful governance agents that demand exit or restructuring. Successful districts might be expected where both aspects work positively as sufficient and necessary conditions. It follows that districts might be less successful not just where neither operates positively, but also in cases where one of the two fails to operate. In such cases, districts might become subject to a variety of different types of 'lock-in' (Hudson, 2005; Chapman, 2005; Popp and Wilson, forthcoming). Researchers have identified three principal types or sources of lock-in: the cognitive, the political and the functional. In the context of this paper, each may be thought of as reflecting an inability or an unwillingness to reorder resource bases to meet changed circumstances, in some instances compounded by the notion of spatial dependence introduced above. Such lock-ins represent, then, the positions of resource dependence in which actors find themselves, these structuring the range of choices they have available to them and the frameworks within which they choose from the different options that are available. Such lock-ins, then, are not given but instead are created over time and are explicable only as the outcomes of concrete sequences of events. They are not inevitable, but are instead about choices made and not made.

One brief example, the Widnes chemical industry in the later nineteenth century, will be used to indicate how our synthesis can aid us in understanding district dynamics and structural transitions. Founded at the mid-century, the Widnes alkali industry was, until the 1880s, characterised by relatively narrow resource bases at the level of the firm and

relatively low aggregate resource dependence, locating the industry in quadrant 4 of Figure 1. Firms were relatively and increasingly specialized in their activities, and thus increasingly dependent on each other, and showed little significant size disparity. In response, the industry had managed to elaborate an effective decentralized, district-level governance system largely based on personal networks forged, for example, through a pattern of ex-employees spinning-off new enterprises and operating at an intensely localized level. Firms shared information and, through both formal and informal mechanisms, collaborated to build social and other capital at the aggregate level. Information costs within the district were low, access to knowledge and other key resources good and accountability, in terms of behaviours affecting other stakeholders, high, conforming to many aspects of the district literature with regard to the effects of proximity.

However, changing conditions in the 1880s presented radical new challenges as Brunner, Mond and Co. introduced the highly price-competitive Solvay process for the manufacture of alkali. Centralization became a pressing priority in order to achieve a lasting and coordinated response. The result was the formation, through merger, of the United Alkali Company in 1890. Crucially, in moving towards merger, the Widnes manufacturers had, in their prior experience of cooperation, a foundation on which to build in combination with the extra-district of leading agents to other UK centres of chemical manufacturing. Existing governance arrangements and good relations enabled them to frame and make the necessary choices over the reconfiguration of resources. Through merger, resource bases were widened and links to external resources providers deepened and strengthened, shifting the cluster from quadrant 1 to quadrant 2 (Popp, 2003).

Thus, whilst both forces inducing transitions and the mechanisms mediating them within the model – particularly, misalignment between resources and governance – explain discontinuous development in business structures, specific outcomes in different districts are contingent, time-dependent and empirical questions. The key point is the non-deterministic nature of the processes - transitions are possible in all directions and are reversible. These final points signal the need briefly to address some historiographical issues.

Conclusions: writing the histories of districts

Despite our claims that discerning and understanding concrete outcomes in specific spatial and temporal locations is an empirical question, and that the model we are proposing is non-deterministic, it might still be contended by some that this work is largely ahistoric – or even social scientistic or economistic.

First, it is worth noting that the insights we have tried to develop here are derived from a large number of 'traditional' and empirical historical studies of English districts. Our method has, then, been largely inductive. What we have attempted to provide should be thought of as not a model of district dynamics or even a taxonomy of district types, but instead as the field of forces within which specific districts may be placed in order that we can better understand their individual and collective histories. Moreover, despite the presence of powerful forces promoting regularities in patterns of development across different districts, these can be and often are disrupted, principally by two factors; contingency and agency – a point made earlier in relation to the concept of lock-in. In exploring these issues, history must remain the ultimate referent. Nonetheless, we reject the claim that business and organizational history has nothing to gain from an engagement with the social sciences – whether that is with economics or sociology.

A perhaps equally serious change is that it is an historical fallacy to take resource bases as *ex ante*. Beyond the simple facts of natural resource endowments, and these are rarely important in the long-run history of many districts, resource bases, both at the level of the firm and the district, are clearly made, not given. Moreover, they are created by human actors within the social arrangements in which they find themselves embedded, social arrangements that do much to shape their access to economic resources and thus their resource dependence. Resource bases and resource dependencies are then over the long-run co-determining. Crucially, that highly complex process of co-determination can only be properly understood through the writing of rich and nuanced narratives that eschew both the teleologism inherent in the Chandlerian approach and the search for the 'ideal-typical' that has come to characterize much of the highly influential Italian literature on districts.

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Figure 1 Resources, governance and industry characteristics

		Resource dependency	
		High	Low
Resource base	Extensive	**Quadrant 2** Hierarchical, centralised	**Quadrant 3** Hierarchical, decentralised
	Narrow	**Quadrant 1** Heterarchical, centralised	**Quadrant 4** Heterarchical, decentralised