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**Formation and Function of Industrial Districts  
in the Rural Northwest:  
Two Cases**

**Harold L. Fossum**

**A dissertation submitted in partial fulfillment of the  
requirements for the degree of**

**Doctor of Philosophy**

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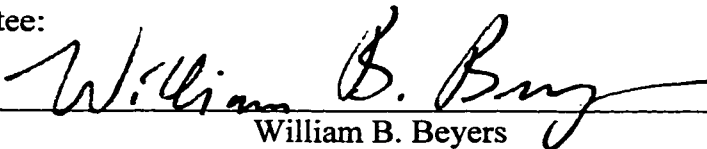
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And have found that it is complete and satisfactory in all respects,  
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Abstract

Formation and Function of Industrial Districts  
in the Rural Northwest:  
Two Cases

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One of the great contributions of recent research into industrial districts is the elaboration of how clusters of small firms in relatively peripheral places can and do generate new competitive advantages. Relatively unexamined in the American research is how flexible specialization is playing out within sectors that are deeply embedded in, and indigenous to, American rural areas.

This study is based on intensive interviews in the log home manufacturing district around Hamilton, Montana, and the boat building district of Port Townsend, Washington. In general, the districts appear to have emerged in a rough sequence of three development “moments” or processes: (1) prior location advantages were exploited by a few firms, (2) external economies fostered the growth of the industries, and (3) localized agglomeration effects developed that fostered an accumulation of benefits to clustering.

In both cases, businesses began to cluster in these locations in the mid-1970s at the impetus of a few businesses, with the division of firms through worker departures an important factor in the early proliferation of firms. Craft organization of the local industries appears central to in these cases, as it both fosters “firm fission” and “circles” of firms whose interaction fosters specialization and exchange.

In neither case does district development appear to have been an accident of external forces, but rather came about through early efforts to foster location and agglomeration benefits. The role of inter-firm local contracting as a primary driver of agglomeration effects is clear in only one of these cases; in the other, contracting appears as one facet of supportive relations within peer circles of firms. Also markedly different between cases is the role of institutions in fostering location advantages and lowering barriers to entry by new firms.

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## Chapter 1: Context and theorization

This dissertation explores emergent industrial districts in the rural Northwest by examining two cases of agglomerations developed in this region's indigenous wood products industry. I aim to broaden the understanding of three attributes of emergent industrial districts. First, I examine development sequences. How do new industrial districts come into being? Second, I consider agglomeration economies as mechanisms of development. What features of contracting, relations and technology of production, and institutions propel regional advantage in districts? Third, I examine the explanatory power of three motive forces that have been the focus of theory about industrial districts: growth and fragmentation of markets, technological shift toward processes of greater scope and reach, and the search for low cost and compliant labor. How do these motive forces relate to rural growth and natural resource intensification that have been the major regional context of this region's changing structure?

Industrial districts have generated intense interest in industrial geography and economic development in recent years. For well over a decade now, economic geographers have debated a set of overlapping theses concerning the nature of contemporary industrial growth and change, a body of thinking that is probably best evoked under the term *flexible specialization*. Ironically, while early statements of the flexible specialization thesis were illustrated via industrial districts of small craft producers in the European periphery (Brusco 1982; Piore and Sabel 1984; Hansen 1990),

more recent scholarship on industrial agglomeration has been overwhelmingly concerned with industries in big cities. This recent focus has the disadvantage of blurring the roles of urbanization and agglomeration economies, giving the discussion about why some places prosper a free ride on more general notions of sheer urban growth momentum (Phelps 1992; Harrison, Kelley et al. 1996). This is especially true when we look beyond the cores of these sectors and ponder the forces that today are shaping rural economic development.

Gertler (1992) has observed that a key shortcoming of recent research on industrial districts is its rather selective attention to new high technology production districts and "rusting relics." Selective attention to high tech and mature manufacturing centers has risked projecting them into a more ubiquitous role than they may have, as lynchpins rather than just two spatially dynamic issues of contemporary development. Within that context, rural locations have often been interpreted as low-cost sites for routine production (e.g., Glasmeier 1991; Glasmeier, Kays et al. 1993).

Product cycle thinking has contributed much to understanding rural industrialization, but the study of rural centers as products of decentralization has limitations. First, it adds little beyond a contemporary articulation of the old product cycle model. What remains unanswered is how important that is relative to other alternative pathways of urban-rural shift (Kale 1989). Second, it assumes that industries form elsewhere first, only later to be displaced to peripheral spaces. My research looks at concentrations of specialized industries embedded in the rural Northwest to find out not how industries break free of established centers, but how they *develop* in first place.

Industrial districts also have generated profound interest within economic development policy and rural revitalization circles (Friedman 1989; Cortright 1990; Rosenfeld 1990; Lichtenstein 1992; Rosenfeld, Shapira et al. 1992; Humphrey and Schmitz 1996; Rosenfeld 1997). The main objective in this area has been to advance the practical matter of district-building. One of the guiding assumptions of the policy approach to district building has been that the development of institutions can make the definitive difference between the formation of viable districts and the reliance on a few industrial interests that are dominant and indifferent to local development outcomes.

The limits of a policy-centered approach are well captured by Bennett Harrison: "The proliferation of state (and of federal-state cooperative) programs in technology policy – especially as these attempt to promote inter-firm production networks – has now far outpaced our critical knowledge of what works and what does not.... It is one thing to make lists of 'innovative' programs and quite another to reach conclusions about what works, under what conditions" (1994, 242-244). My second research question rises to Harrison's challenge to better understand what features of industrial districts are (a) prior and uncontrollable conditions delimiting the place and products of districts, and (b) likely to have a dynamic influence on their form and function.

What is the fate of those rural places that have witnessed firsthand the flight of routine producers to lower cost locations? Do they wither on the vine? The "death" of rural communities so afflicted by globalization of commodity production is more than just a popular image. The beggaring of rural places by other regions that provide cheaper and more pliant labor and less restrictive environmental regulations is an explicit

expectation of globalization within the critical literature (Amin and Robins 1991). This stands in abrupt contrast with two more sanguine streams of thinking, in which new possibilities for the reemergence of regional specialties are thought possible under globalization. In one interpretation, the resurgence of regional advantage is made possible by the emergence of a new technological/communications paradigm which at once favors product customization and discourages vertical integration (Scott and Storper 1987; Storper 1997). In another, market change fuels the resurgence of regional specialization by way of growth, diffusion, and fragmentation of consumption (Piore and Sabel 1984; Schmitz 1995).

The third empirical contribution of this study lies in its potential to inform the debate about what particular conditions make industrial revitalization and regional redevelopment possible. The two wood products cases in this study provide some insights about the limits of local decline and the nature of local regeneration in the contemporary rural Northwest. The present inquiry cannot weigh the precise role played by these three main influences, but we can seek out the relationships to the major forces of contemporary industrial change in these cases.

I focus in this dissertation on economic development in the rural Northwest, focusing particularly on formative agglomerations of wood products specialties within the region's forested areas.<sup>1</sup> In the rural Northwest, clusters of small specialized firms

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<sup>1</sup> Held apart here is a discussion of food and agriculture, another prototypical rural industry. The geographies of food and wood products appear to be quite distinctive. Solid wood products are sold into

have grown out of historic and staple industries, and in several areas, appear to be diversifying their structure into flexibly specialized production systems. I examine two such cases to inform theory about why and how processes of sectoral concentration can and do give rise to new territorial specialties.

The first is a concentration of log home manufacturers in Hamilton, Montana. The second is a dense cluster of shipwrights and affiliated marine trades in Port Townsend, Washington. Since the origins of these clusters can be traced to the 1970s, both provide the opportunity to examine agglomerations in relative nascence. Both feature craft labor and are characterized by small firms.

I arrived at these cases through preliminary studies of local specialization in secondary wood products. That early phase of the research began with a comprehensive data base of secondary wood products manufacturing establishments, which was used to identify concentrations of firms in like industries. Selection of the study cases was informed by expert interviews.

Agglomeration studies usually concentrate on one industry, as a way to generate working understanding of development paths along lines delineated by industry type (Schmitz 1995). In selecting these cases, I sought both subsectoral variety and similarity in stage of development, neither infant nor mature.<sup>2</sup> I reasoned that similar forces

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craft production relatively early on their path to consumption; food products are, by contrast, more industrially produced and hierarchically distributed. Mining and tourism are also prominent in rural areas, and have distinctive form.

<sup>2</sup> Infant cases are problematic because it is hard to operationalize agglomeration effects finely enough to differentiate districts from mere clusters of similar firms. This is especially problematic in rural areas, which are defined by relative sparsity of settlement and large distances between producers (Schmitz 1990).

propelling a traumatic restructuring in primary wood products within the rural Northwest – technological intensification, wood shortages, and dispersed population growth – might be expected to drive development upstream, toward secondary wood products. Through processes of agglomeration, some production niches would coalesce in regional specialties. Both history and theory suggests that recent conditions are right for the genesis of clusters of a sort that may (or may not) be a growth path of rising importance in the American periphery.

A key expectation of the flexible specialization thesis is that industrial districts are a prominent pathway to industrial development, and will become more so (Piore and Sabel 1984). Even among growing manufacturing regions, development by industrial district is but one passage to growth (Markusen 1996), and an unstable one at that (Harrison 1992; Gough 1996; Gough 1996). Nonetheless, the expectation that flexibilization and the disintegration of production will find spatial expression not only in the evolution of old industrial centers but in the development of new ones is increasingly accepted, as is the caveat that districts are but one possible expression of these same forces (Gertler 1992; Storper 1997). In considering regional industrial specialization, particularly in a peripheral context, care must be taken not to confuse the notion of rising possibilities with imminent universality.

At present, full-blown industrial districts appear to occupy a modest place in the rural Northwest. This project does not attempt to measure precisely how big that place is.

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Mature cases pose a different problem, as they are prone to fragmentation on product cycle lines [Scott, 1987 #17; also see the example of a molding cluster in Braden, Fossum, et al, 1998].

It can, however, consider whether contemporary forces are raising the power of agglomeration as a force of industrial development and specialization, as the flexible specialization thesis suggests.

Industrial agglomeration is a basic mechanism of industrial development, but much remains to be known about what sort of mechanism it is. Compared to alternatives – urbanization, large plant investments, footloose retirees, isolated niche exporters – district phenomena are rather poorly understood causal agents of industrial shift and change. Lacking a better comprehension of the form and function of district phenomena in rural space, we can only guess at some key issues. In the geographical literature, formation of industrial districts has been thought as a primary motive force. For instance, Piore and Sabel (1984) suggest that agglomeration effects could be a basis for the reconstitution of industries along regional lines. In the regional literature, however, district effects have been viewed as byproducts of other developments. Regional scholars in the Northwest have, for instance, cast industrial specialization in wood products as a tertiary effect of amenity-driven growth (Power 1996).

Three questions primary to my research are among the unexplored aspects of such processes. First, what is the *sequence of development* of these clusters? Do districts emerge first as industry clusters (groups of similar, nearby firms), only later to develop agglomeration economies? Do they arise out of pressures within the firm to disintegrate in avoidance of certain risks and costs? Recent theorizations have been sketchy and contradictory, and in need of empirical refinement. I follow the path to emergence in two cases and examine them against alternative conceptions of district formation.



Second, by what mechanisms does new capacity develop within industry clusters?

Recent contributions follow two main lines of thinking. The first concentrates on the dynamics of trade between firms. I explore the role of contracting in firm proliferation and specialization, as well as product and market leadership. Whether contracting is simply a means to the end of the fluid exploitation of labor also bears examination. The second main explanation concentrates on agglomeration economies outside the strict realm of exchange, that encompass exogenous conditions such as the massing of a skilled labor force, advantageous infrastructure and distribution systems, a thick web of ancillary services and suppliers, favorable norms of exchange and information sharing, as well as institutions that spread entry costs and reduce the chance of failure. The form and role of institutions of collective action are of most interest for determining policy directed to encouraging district development. Forms of collectivity (a notion that includes inter-firm contracting) have been thought significant in much of the policy-focused literature on districts.

Third, what *generative forces* account for the emergence of the two localized specialties in my study? In prior work, discussion of motive forces has been taken at highly aggregated scales. It seems likely in the cases of my study that regional growth and population diffusion might be as important as the more generalized drivers discussed in prior work: market fragmentation, technological shift, and labor dynamics. In other words, the standard slate of macro-effects may have direct bearing at the regional level, or may fade in power as the scale is reduced.

For each case, then, I examine key points in the sequence of cluster formation and development. I explore the nature and role of inter-firm linkages, nonmarket exchanges, and social institutions that create a cluster larger than the sum of its parts and ask what accounts for those ties. I consider motive forces that have given rise to these agglomerations and explore the prospects for these districts and other emergent districts. The overall aim is to add new depth to our understanding of agglomeration as a process that plays a central role in the industrial formation and development of this rural Northwest sector.

*The new center vs. adapting hierarchy debate*

Meric Gertler maintains that "the 'flexibility thesis' has brought a prominence to spatial research that is unmatched by any other idea to emanate from geography, regional science, or planning" (Gertler 1992, 259).<sup>3</sup> Attention to the flexibility thesis reflects, in part, its dramatic and tangible expectations for policy. One of its chief exponents forthrightly concludes, for instance, that contemporary forces *make possible* the "reconsolidation of the region as an integrated unit of production" (Sabel 1989, 18). At its core, the regional centers thesis is not proposed as a sure thing: it is about the *potential* for regional resurgence. This amounts to a provocation to those analysts who have both chronicled and agonized over the globalization of production. Bluntly, globalism is for shirkers.<sup>4</sup> The regional resurgence thesis is also potent because the explanation backing it

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<sup>3</sup> Gertler refers here to the broader discourse on flexibility, of which interest in agglomerating and degglomerating tendencies in industrial development is a major part.

<sup>4</sup> Piore and Sabel argue that the alternative, global view is demonstrably undesirable. Policy and scholarly acquiescence to it is necessary for an industrial progression toward an global economic order, in which major corporations hold a controlling interest. The implication is that radicals, in particular, are shirkers, on

is relatively clear and complete. This accessibility coupled with provocation has made flexible specialization a conceptual foil for various disciplinary lines of critique and synthesis.

A fundamental alternative to the expectation of "new centers" or adapting hierarchies has been prominent in scholarly discourse within the flexibility thesis, and deserves some attention here. Typical of the contra-flexible specialization literature is the assertion that globalization is the more defining feature of the present period. The broad lines of Amin and Robbins's critique (1991) is representative. Amin and Robbins hold that the world is not organized, as Scott has maintained (1993), as a series of agglomerations with periphery effects, but by the persistence, through restructuring, of hierarchical forms of industrial organization. Although these hierarchical regimes may have nested in a few localities, such nodes are not only exceptional, they are integrated into networks of immense spatial reach (Amin and Thrift 1992). The key contemporary development is that integrated, local hierarchies are giving way to more varied forms of network hierarchies.

Of particular interest here is the clear expectation that Amin and Robbins present for rural territory: "the further we progress away from the central nodes of the new networks, the more the localities resemble the so-called old fordist branch plants" (114). Beyond privileged central nodes lie "cold peripheries of economic decline" where:

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the logic that (a) a major alternative to global (quasi-)integration is possible and desirable, (b) radicals are committed to fomenting a better way, but (c) are not doing so at the critical moment, when an industrial watershed is at hand. The challenge was tacit but, to judge from the main thrust of the subsequent critique the substance of this challenge was not lost on its audience.

communities devastated by the transfer of capacity overseas, or, at the opposite pole, in cheap-labor zones offering little more than screwdriver plants, the gradual historical erosion of skills, technologies, institutions and resources sacrificed to external interests has made it virtually impossible for them to play a positive role in the new round of restructuring (115).

There is nothing new or controversial in the underlying premise here, that many conditions shaping industrial development are neither universal nor malleable by regional agents. Amin and Robins go far beyond this. They bluntly insist that resistance to globalizing forces is futile; initiatives that presume otherwise are "cosmetic" at best, and at worst "unwarranted diversions." (From what they divert us is not said.) Rural industrial prospects are, they conclude, entirely dependent on scraps from distant corporate roundtables, which are never sufficient to nourish new agglomerations. What is remarkable about this argument is that network hierarchies are set out as the only prospect for rural development.

The rural scholar is, therefore, caught between poles of hyperbole: industrial districts are ubiquitous / industrial districts are preposterous. We must look to more formal theory to begin to envision the place, role, and prospects for districts in rural space.

### *Definitions in the underlying theory of districts*

Few theories have proven more flexible than flexible specialization. Indeed, the thesis has been criticized for over-reliance on fuzzy concepts (Markusen 1998). For the purposes of this dissertation, the following terms need to be clarified.

The term *industrial cluster* denotes a sectoral and geographical concentration of small firms. This reformulation of the industrial district notion is intended to dismiss a

*priori* assumptions about the functionality of like-neighbor firms, and adheres to Schmitz's (1990) approach.<sup>5</sup> An industrial district is necessarily a cluster, but qualities thought to generate regional advantages within districts may be absent or undeveloped in clusters.

*Industrial districts* commonly refer to clusters with deep inter-firm divisions of labor. The term can be traced to Alfred Marshall's *Principles of Economics* (1925). Interestingly, Marshall did not define the notion so much as suggest by illustration that districts are characterized, at least in maturity, by rich local trade relationships. He also made clear that the emergence of deep, local, inter-firm divisions of labor is only one of several industrial dynamics that propel development within clusters. More generally, then, industrial districts refer to clusters of small firms that draw localized advantage from both external economies and agglomeration economies.

The distinctions between external and agglomeration economies are simple, but prone to elision. In Marshall's basic notion, external economies are not necessarily spatially bounded, while Weber's (1929) agglomeration economies specifically are. It has become quite well accepted that agglomeration economies are the subset of external economies that bear directly on localization (Phelps 1992).

*External economies* are those conditions that support the general growth of an industry, and stand in contrast to internal economies which favor the growth of individual

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<sup>5</sup> This differs from Porter's (1990) use of the term cluster, which is more expansive on both geographical and sectoral axes. Schmitz is comparable to Rosenfeld (1997); in both Rosenfeld and Schmitz, the term cluster makes no assumptions about functionality of kindred, proximal firms. Rosenfeld, however, attempts to class features that denote ascending functionality. For Schmitz, the term is strictly an operational means stripping the term *industrial district* of the baggage of assumptions.

firms. Externalization is a specification of the more general idea of industrial economies (Marshall 1925). Key to *industrial economies* is that, by way of innovation or market change, production becomes alienated from its prior setting and accumulates anew at the industrial scale. The result is a synthesis and redistribution of locational advantages. Externalization places the consequent re-accumulation at the general (industry) scale; *internalization* places it within the firm. It should be clear from the above discussion that externalization entails general industry growth, but not necessarily the localization of that growth. The impulse of the firm is to internalize the benefits of industrial economies and externalize the cost of diseconomies. Firms, however, exert only limited control over many conditions of externalization. As a consequence, firms have a secondary interest in localization, since the associated external economies imply declining costs (Scott and Storper 1987). Oughton and Whittam (1997) note three types of external economies.

First are *pecuniary*, or *competitive* economies, in which input costs decline because of competitive pressures on firms to surrender the benefits of greater efficiency in the form of lower prices. Such economies arise from increasing returns in internal (firm-level) economies that pass into external (industry-wide) benefits through generalized cost reductions. By these means, for instance, efficiency in primary wood products production may generate external benefits for downstream producers in construction, furniture making, mill work, and joinery.

Second, *exogenous* and *technological* economies are independent of internal economies and are characterized by the emergence of new technologies, education, transport and communications infrastructure, skilled labor pools, and the "thickening" of

the industry into subsidiary trades. Stability of demand also falls here. (While the stability of demand afforded by urban markets was noted by Marshall, contemporary accounts accentuate the limited ability of large firms to engineer demand stabilization in expanding and fragmenting markets (Piore and Sabel 1984) and when changes in technology effect shifts in the magnitude and pace of demand (Scott 1983).) Marshall's notion of *industrial atmosphere* is also a constituent of exogenous economies; this concept alludes to norms, skills, and knowledge that take on the character of public goods.

Third are *collective* external economies, which arise when firms pool fixed costs, shifting average cost curves down and lowering entry barriers for new firms (Oughton and Whittam 1997). Such economies are quasi-internal, because their benefits are limited to cooperating firms; they require active involvement of firms; they depend on the maintenance of cooperation; and, to the extent that entry is not restricted, they are pro-competitive. Collective external economies amount to outright agreements among firms, and such agreements may occur in formal, public or quasi-public institutions within the public sphere. In the present cases, for instance, the Port of Port Townsend is a clear example of a public collective effort whose infrastructure investments pool costs and reduce barriers to entry for small firms.

*Agglomeration* economies deal specifically with the localization of industry. Although external economies facilitate the general growth of an industry, such economies have only an indirect bearing on agglomeration by enabling a shift in industrial organization from integration (internal) to disintegration (external), *but not by localizing*

it. Weber mentions only three broad types of agglomeration economies: the development of technical equipment, the development of labor organization, and the better adaptation to the economic organization as a whole (*op cit.*, p. 128). It has become standard in the parlance of this literature to splice Marshall's more exhaustive listing of external economies into Weber's more cursory one: agglomeration economies are those external economies that bear specifically on localization.

It may be useful to conceive of industrial agglomerations in terms of the fundamental forces underpinning economies of scale: specialization in management and labor; cost economies of larger scale and scope of production; and pecuniary input economies that comes with purchasing in volume (Dicken and Lloyd 1990).

Agglomeration tendencies have countervailing forces of de-agglomeration. Scott and Storper (1987) discuss these mainly in terms of labor politics, but other fragmenting forces may be expected. In the present cases, value-bulk ratios, natural resource scarcity, and market sparsity may be expected to limit market reach and impose countervailing limits on the extent of agglomeration in specialized wood products.

The problem with the foregoing concepts is that the analyst is left with notions that can be observed at the case level, but are difficult to operationalize *a priori*, and this limits the power of macro and comparative analyses. This limitation will not be resolved here. It is sufficient for this dissertation to note that externalizing and localizing forces *can* be defined and examined at the case level (Scott and Storper 1987). Moreover, they seem to appear in sequence, with the general external economies as prior conditions for the local ones (Oughton and Whittam 1997).



For example, while it is clear that agglomeration refers to the general benefits to an industry from localization, the lines between externalization and localization are consistent across neither time nor industry. Changes in technology may, for instance, constitute externalizing "windows of opportunity" for far flung locational branching in some cases (Scott and Storper 1987), while in others the transaction costs of implementation and upkeep favor localization at the source of new technology and foster "implementation pathologies" at a distance (Gertler 1995).

***The theory of formative agglomeration***

The foregoing concepts point to some rough theoretical guideposts about how industrial districts may develop in rural areas. Phelps's (1992) careful review of Weber and Marshall suggests that district development follows a sequence of location, externalization, and agglomeration.

It is presumed that prior presence (location) of an industry is a minimum requirement for industrial concentration. Weber noted that location factors can be deduced from "known factors of some isolated industrial process," and limit what may locate where, but it is the "social nature of production" that drives subsequent agglomeration (1929, 124). Location bears on the classical constellation of input, market, transportation costs, which account for the initial presence of a few, isolated firms. Weber maintained that agglomeration is subsequent to location and socially determined. In conditions of clustering, the benefits of agglomeration economies become reflected in the value of place, and exert circular effects on subsequent development.

This conception of location may seem problematic, since what begins as a matter of prior presence is quickly reasserted as a reflection of agglomeration effects (i.e., location begets location). Resolution to this problem is found in the concept of ground rent, which is determined by a period-of-time appraisal of a location's physical (natural) and social (urban, built) attributes, *net of prospective improvements* to the site itself.<sup>6</sup> Hence, location appraises a stock of attributes at fixed points in time, while externalization and agglomeration describe flows, processes of development.

The preconditions to agglomeration and district formation are not limited to location. Also necessary are conditions of externalization at the industry scale. Market growth, for instance, may enable a finer division of labor in the industry. Volatility in demand may feed market segmentation, or present risks to be externalized by inter-firm contracting. Technological change may create new economies of scale and scope; imply branching points; or particularly for our purposes, enable aspects of production that historically diffused around population/market lines to concentrate along industrial lines. Systems of material supply and distribution may further enable production to become divorced from population centers and attached to industrial centers.

Location values shape *where* industries might agglomerate, and conditions of externalization shape *what* may agglomerate; such things constitute prior and

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<sup>6</sup> The notion of ground rent is derived from English common law. It suggests a separate ownership of the land and its improvements, buildings, plants, etc. Ground rent value is free-hold and is distinct from lease-hold. The former reflects the value of land net of subsequent improvements, while the latter implies the value of improvements. The lease-hold interest, however, is limited in time, after which the value of improvements may be considered part of the free-hold and incorporated in ground rent (Stiegeler 1985). Location embodies a similar problem; we want to distinguish prior attributes from ones that are *developed*

independent conditions, external "realities" for purposes of development possibilities.

While these are preconditions for district formation, they are not necessarily preludes to it. Agglomeration economies bear specifically on regionally bounded, social advantages and include exogenous (largely incidental) economies and collective (entirely purposeful) ones.<sup>7</sup>

Agglomeration denotes the social process of industrial localization and district formation, and it is nominally identified by the proximity of like or linked firms. The nature of agglomeration has been the subject of an intense and wide ranging debate in economic geography in the last several years. The emergence, by whatever means, of a cluster of competing firms exerts centripetal forces on skilled workers and producers of ancillary goods and services. Proximity reduces transaction costs, facilitates information flows, and generates easy opportunities for inter-firm contracting, all of which may foster specialization. The presence of a nucleus of like-neighbors may justify investments in physical and social infrastructure, as well as formal cooperative institutions. It is relatively well accepted that the mix of such dynamics is particular to places and industries; a cluster develops, in part, via internal forces that shape and propel it.

In recent accounts, the development of deep, local inter-firm divisions of labor has been noted as a decisive feature of district formation.<sup>8</sup> A component of local

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via externalization and agglomeration. The concept of ground rent suggests that location may be set apart from agglomeration by simply designating it as *period-of-time*, net of prospective improvements.

<sup>7</sup> The incidental vs. purposeful nature of exogenous and collaborative economies has led several analysts to focus on the later as entry points for policy. See for instance Scott (1996).

<sup>8</sup> While the development social divisions of labor are important to understanding agglomeration as development process, they are not an end-point. Agglomerated firms can and do re-accumulate and re-

contracting may be attributed to industry thickening via the development of accessory producers, and providers of services and transportation and attributed to location value. In addition, however, we may envision that contracting exerts a specializing force on erstwhile similar firms. As head-to-head competition is supplemented by inter-firm contracting, similarity gives way to complementarity, and competing producers verge toward interdependence. The process is entirely comparable to speciation in evolutionary biology. As complementarity proves functional, small initial differences become magnified into distinctive means of survival. Close proximity (island conditions, in the idiom of bio-geography) accelerates and intensifies the process of niche-seeking.

The matter of where clusters come from in the first place is, however, far less well understood: the emergence *by whatever means* of an industry cluster makes possible a whole slate of subsequent dynamics. This is, in itself, of immense practical significance. Thus, we focus on a riddle posed above. By what alchemy do clusters-that-would-be-districts arise?

One prominent framework suggests that districts emerge from the disintegration of previously integrated firms. Michael Storper's recent work (1997) presents the common theoretical view within this explanation in his examination of the film industry's evolution in Hollywood from Fordist-Taylorist to flexibly specialized organization. Roughly, the motion picture district of Hollywood emerged as major film-making firms contracted out previously internalized production. In this and other cases, seminal

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integrate production. Harrison (1992) emphasizes that flexible specialization is not a stable state, and this has been borne out by subsequent case research.

attributes of industrial districts appear to be embedded in the district *at its inception*.

Certain agglomeration economies – such as labor advantages, technological advantages, and an amenable industrial atmosphere – are in place at the time market forces compel the shift from internalization to externalization of production. Crucial is the behavior of internalized firms under market pressures. Those firms that seed industrial districts move to take strategic advantage of localization economies, even at a sacrifice of externalizing some potential profit. Those that do not (whether for lack of underlying agglomeration economies or for unwillingness to externalize the benefits of production) invest in more spatially diffuse forms of internal control – network hierarchies, in Amin and Robbins's lexicon – or they simply retrench.

A second interpretation emerges from activist- and policy-oriented literature (for instance: Rosenfeld 1993; Schmitz and Musyck 1994; Humphrey and Schmitz 1996; Rosenfeld 1997). Here, clustered firms are targets of policies designed to foment exogenous and cooperative benefits. Most domestic and international policy initiatives take like-neighbor producers as starting points for organizing efforts under the presumption that districts are preceded by the presence of a-functional clusters, which then *develop* the social attributes of a district.

Here, then, is a fundamental breach between theory and practice of district formation. While theory places the externalizing firm in the central position, policy initiatives have privileged extant clusters of kindred-but-competing producers under the assumption that agglomeration economies can be generated among firms that may lack a history of direct linkages or untraded interdependencies.

If the theory is correct, district building initiatives might fail for any of three reasons: (1) by targeting industries in peripheral areas that have no location (i.e., "ground") advantage for the sector in the first place; (2) by focusing on industries not prone to underlying processes of externalization; or (3) by wrongly assuming that collaborative and exogenous efficiencies can be induced among like-neighbor firms are already reliant on other *non*-local institutions and linkages.<sup>9</sup>

***Historical perspective: Restructuring as a driver of rural agglomeration***

Sectorally and geographically clustered firms are the starting point for most discussions of agglomeration. The distinctions between those firms that are clustered and those that are geographically and sectorally dispersed are, however, more problematic than meets the eye. Schmitz (1995) presents "village" carpenters and blacksmiths as archetypal examples of non-clustered firms, and these examples are sufficient to make the point. Clusters of construction firms are common enough, but these may owe their existence to nothing more than concentrated growth in building. That such contra-examples often accumulate along market (i.e. population) lines suggests that the line being drawn here is between firms clustered by consumer markets vs. by industry centers. This is broadly consistent with recent theory on industrial clusters which addresses industrial dynamics, not simply matters of urban scale.<sup>10</sup>

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<sup>9</sup> The may also fail because of ineffective implementation. This would be a key issue for program evaluation, but is of oblique interest to the present inquiry.

<sup>10</sup> In fact, Marshall (1925) includes examples such as bakers and confectioners in his discussion of industrial districts, making clear that the key point in his mind was not the role of districts as exporters, but more simply as an alternative to larger, more internalized forms of industrial organization. This conception has been supplanted by close attention to districts as sources of basic regional advantage, and I follow that convention here.

Of course, market size has a great deal to do with the degree of industrial specialization. Adam Smith's ancient maxim, that the division of labor is limited by the extent of the market, has never been lost on analysts of this problem. Yet, in supplanting seedbed theory (Struyk and James 1975), flexible specialization theory rejects the notion that territorial complexes are constrained to urban places, where agglomeration economies are manifold, and replaces it with a focus on processes *internal to* industrial organization and the social division of labor (Scott and Storper 1987), a shift adhered to within the critical literature (e.g., Amin and Thrift's focus on network hierarchies). In fact, a major foible of much recent work has been to simply infer that districts are supported by rich local trade relations, defining industry-specific effects into the equation and defining out general urban effects – a swapping of new assumptions for old. Harrison, Kelley and Grant (1996) suggest that this is a mistake, for many clustered industries do appear to draw much of their power from general urban effects.

In defense of Scott, Storper and others, many of their cases occupy niches on the global scale. It is hard to maintain that movie, fashion, and aircraft centers owe their existence to the general features of their urban milieu. The trouble is that such centers are held out as representative, and this fosters the illusion that contemporary district phenomena might somehow be limited to grand, global cases (in grand, global cities); they are not. Problematic as it may be, Scott and Storper's re-theorization crossed an industrial divide of a sort, advancing agglomeration studies from broad conceptions of the role of urban density to specific ones of industrial organization. Long after this

dissertation is finished, it will still remain to be seen which of these is dominant. The box has been opened on a great geographical conundrum.

The ambiguous relationship between urbanization and agglomeration is stretched to the breaking point when we concede that even "local" confectioners and construction firms serve markets that are more or less regionalized. What this means is that we cannot say definitively, only relatively, that industrial clusters bring export earnings and market-center clusters (to coin a term) do not. This is a niggling point in cases where the industries of interest are prominent on a global scale, but it may be crucial to understanding cases where area specialties develop on the basis of a widening regional market, as in Jane Jacobs's conception of development by import substitution (1984). Conditions in "home" markets matter.<sup>11</sup>

Another contrast to industry clusters, particularly relevant in the peripheral context concerns firms that are dispersed along *both* population and sector lines. Examples include primary resource producers (e.g., farms, mines, logging operations) and processors (e.g., produce packers, sawmills). Such things are not, of course, scattered randomly on the landscape, they are positioned in accord with natural resource endowments and market access. There are entire literatures devoted to articulating the tiered land use specialization thinking of von Thünen and the location effects of transportation costs advanced by Weber (Weber 1929; Isard 1956; Moses 1958; Phelps 1992). At present, three simple points must be observed: extractive industry is located at



resource origins; primary processing is organized along lines of transit that link these origins to markets; and higher ratios of value-to-bulk tend to draw producers closer to market centers resulting in a tiered structure of value around core markets.

The point is that market centers (that is, cities) are the main form of clustering presumed in this classical conception of industrial formation.<sup>12</sup> Easily overlooked in this equation is that markets for primary commodities are not final consumers, but secondary and more specialized producers. As Marshall pointed out more than a century ago, markets of producers tend to congregate on urban fringes (Marshall 1925). From the earliest formulations of spatial economic theory, then, we find hints that the tendency of clusters to diffuse to peripheral locations is bound up in questions of industrial function within the evolving urban form. The expansion of cities, and the growth of smaller cities and *their* peripheries has, of course, been a defining feature of development in the Northwest over the last three decades (Elliot 1996; Wardwell 1997). Shifts in urban patterns, combined with more general globalization of markets, has contributed to making point conceptions of urban markets increasingly problematic.

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<sup>11</sup> Schmitz's archetypes are especially fortuitous here, for the present study identifies clusters of firms that are specialized derivatives of these sectors that have become well established as exporters to regional and national markets.

<sup>12</sup> Industrial *complexes* are, however, embedded in rural economies, raising the need to distinguish a complex from a district. Complexes differ from districts in both regional and sectoral scope. Complexes typically refer to a more regionally diffuse form. They also focus more on diverse up and downstream linkages, and less on specialized components of it; for example, the solid wood products complex rather than the log home district. In all, the distinction is more one of focus than functionality: industrial districts may be conceived as the more specialized, innovative, and localized core of an industrial complex upon which changing input and output conditions are expressed in the development of the core industry. The key point here is that complexes are often organized on the rural landscape as vectors supplying more

I have noted that a key critique of the flexible specialization thesis embodies a very specific and narrow expectation about the draining effects of globalization on peripheral places. In the following paragraphs, I argue that, under current conditions, global restructuring of the sort described may have the opposite effect. It may increase the importance of agglomeration processes in the periphery.

A basic element of Amin and Robins's (1991) argument (which has been repeated by others) concerns the unlikely propagation of new agglomerations in peripheral space. The argument goes like this: industrial intensification wrought of competition yields an abiding net shift of production out of rural places; what investment remains is increasingly expressed via hierarchically integrated and globalized systems of production. There is nothing special about singling out routine manufacturing as Amin and Robbins do. The logic of the argument works as well when we insert in its place food and agriculture, forest products, textiles, etc. The prognosis for all but the most richly endowed or rural places is the same. Intensification drives an organic net loss of industry and generates an interlocal competition for subsequent investments by global "systems" producers. That this competition hinges, to a degree, on tax, labor, and environmental concessions has led some analysts to dub this process "the race to the bottom" (Tobey, 1990). The broad expectation is of a generalized, downward spiral of peripheralization, through which the prospects for local articulation of industry become progressively dimmer.

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innovative and agglomerated sub-specialties. At issue here is whether and why those localized cores may become more common and more diffusely located.

Three features of this argument are suspect. First, as noted above, is the overbearing pessimism with which its critics (Amin and Robbins 1990; Amin and Robbins 1991; Amin and Thrift 1992) greet the idea that the opportunity set for rural development contains anything more.<sup>13</sup> A great deal is staked here on the unlikely proposition that markets have essentially been replaced by global hierarchies. Surely quasi-integrated, globally expansive firms are important to understanding an element of restructuring in the periphery. But these critics err badly to suggest that such forms are *it*. Not all rural places bereft of investment via global hierarchies are, as they say, "cold peripheries of economic decline" (Amin and Thrift 1992, 115).

Second, when the contention that rural development paths are severely limited is excised, we are left with the old observation that rural intensification is a driver of economic and demographic flight, a view that is seminal, but of diminishing significance. The depleting effects on rural economies of industrial intensification are among the quintessential problems of rural development. When we describe rural change of this type, we must understand that we are referring to a restructuring that has been underway for well over a century. This type of restructuring continues to be significant in those localities that remain narrowly dependent on one industry, and to understanding such topics as food distribution systems. The result of chronic restructuring in agriculture, however, is that the industry has shrunk into relative obscurity. Primary farm and forest

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<sup>13</sup> It is interesting to note that the British literature appears to treat the notion of *rural* specifically in terms of natural resource dependence (Goodall 1987), a practice that defines limited economic alternatives into the equation. It is, I think, tautological. I follow the American convention, which tends to use the term as a reference to population sparsity.

employment now constitutes a rather modest proportion of all employment, even within rural territory (for a Northwest regional view, see: Power 1996).<sup>14</sup>

One consequence of longstanding rural intensification is that it may have brought us to a point of demographic equilibrium. This is precisely the conclusion reached by Calvin Beale (1997) in his recent study of the net migration shift to nonmetro parts of the United States. The small proportion of rural residents that stand to be displaced to urban locations by this classical process is now (and will likely remain) more than offset by the large proportion of urban residents who settle in rural places. If we concede that the abiding net urban-to-rural migratory shift has any meaning at all, then we must recognize that the problem of intensification within rural industry may have become a minor contributor to the overall profile of rural restructuring. What *does* constitute the overall profile is a detailed question that is the subject of a different debate about the components of industrial and migration change. Suffice it to say that one effect of population dispersion and declining transport cost is to enable firms to achieve economies of scale and agglomeration at more rural points in the city-size continuum (Wardwell 1980).

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<sup>14</sup> Aggregate analysis of industrial shift in the United States indicates that manufacturing has been a significant recent contributor to growth of nonmetropolitan BEA regions. In all such regions, manufacturing employment grew at the rather brisk annual rate of 1.3 percent in the 1985 to 1995 period, with a concurrent rise in the overall location quotient of nonmetro manufacturing to 1.29 (from 1.11 in 1985). While these figures suggest that manufacturing is, in general, dispersing, it must be pointed out that manufacturing is among the more concentrated of aggregate sectors: by Beyers's analysis, its coefficients of industrial concentration rank it fifth most concentrated among major sectoral divisions (less concentrated only than mining, educational services, ag-forestry-fishing, and legal services). Notwithstanding the diffusion of manufacturing employment to nonmetropolitan areas, coefficients of industrial concentration actually *increased* between 1985 and 1995, suggesting that what is being observed in the manufacturing sector overall is not general diffusion, but rather to displacement from specialized metro manufacturing areas to specialized nonmetro manufacturing areas (Beyers 1998).

This brings us to the third questionable premise: that the prospects for rural agglomeration are best understood in reference to restructuring within rural territory, when it may be better viewed in terms of restructuring at the urban or national scales. In *Principles of Economics*, Alfred Marshall discusses at some length the relationship of declining agricultural population to subsequent industrial specialization (1925, pp. 274-277). That is fortuitous, for it permits us to examine these conceptions in his original work.

As early as 1890, Marshall concluded that some apparent declines in the agricultural population are merely the decline in self-sufficient production of consumer goods by farmsteads. Farmers were spending more time in actual farming, and buying more of the goods they consume. There was also a substitution of machinery and other purchased agricultural inputs to farming, resulting in the reclassification of labor into other specialties. The concomitant rise in the proportion of employment in manufacturing was due, in part, to the reclassification of agricultural production into specialized manufacturing categories. In addition the globalization of markets for agricultural produce fostered a declining presence of agriculture in more marginal areas, with two consequences: (a) a displacement of workers from the agricultural complex to urban areas, and (b) the growth of a transportation and distribution complex of global scale.

Marshall then notes that "labor set free" in the process of agricultural specialization, and relocated largely to cities, concentrated in "*supplying those wants in regard to which the improvements of machinery help us but little.... In none of these is there very much help got from new inventions*" (emphasis mine). Among the booming

occupations of that day, for instance, were services of government, education, entertainment, and health care, and also of servant production embodied in confectioners, hotels, messengers, etc. He concludes that "these changes have tended to increase the specialization and localization of industries."

If anything is surprising about the first part of Marshall's description, it is how little has changed in the century since it was written. Marshall describes the globalization of agricultural production, the thickening of the complex as a far-flung input-output system, and the alienation of agricultural manufacturing from farming territory. But Marshall then considers the effect of labor displaced by agricultural intensification upon subsequent localization, and this is fascinating, because he identifies two issues that are virtually absent in the contemporary discourse on agglomeration: (a) a *locational shift*, in which rural intensification fosters urban growth via different rates of labor shedding, and (b) an *industrial shift*, embodied in the evolution of work toward less-mechanized, more labor intensive tasks. The recent discourse on agglomeration has tended to interpret district formation almost exclusively in terms of intra-industry dynamics.<sup>15</sup>

With Marshall's work in mind, what seems remarkable in recent flexible specialization debates has been the abiding fixation on isolated plant investments as the antithesis of agglomeration to the exclusion of other effects. Marshall reminds us that the matter is not so simple; in addition to the immediate effects of industrial intensification *qua* disinvestment and regional specialization, we must also consider the secondary

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<sup>15</sup> Marshall raises these phenomena explicitly as bearing on district formation. The recent focus in agglomeration studies is the contention that intra-industry effects are primary to district formation, which

effects of industrial shift and human dislocation. Beale (1997), moreover, reminds us that we need to take proportionality and equilibrium effects into account; the origins and directions of shift, while historically rural-to-urban, must be reexamined in light of present patterns of development.

This is precisely what economists Thomas Power and Raymond Rasker attempt to do in the context of regional analysis of development prospects in the western United States (Power 1996; Rasker, 1995). They argue that the gradual decline of natural resource-hungry primary processors actually improves the net prospects for sustained economic development. This is not a magical case of addition by subtraction. Power focuses on the growth of smaller cities of the Northwest, and the rise of the amenity-related rural settlement, particularly to forested areas. Specifically, these researchers anticipate urbanization, the rise of a footloose array of retirees, non-locationally bound employees, small service firms, and other niche producers and the growth in specialized and high-value wood and food products.

The weakest point in Power's thinking concerns the mechanisms by which this high-value wood and food products (colloquially referred to as "value added") might develop. Part of the answer is in the cumulative effects of general population growth; larger markets affording greater downstream specialization and finer divisions of labor. Market growth, for instance, brings external economies that support general industrial growth and differentiation. Another element concerns the sort of industrial shift referred

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will be discussed in the following review chapter. I do not mean to imply that these issues are absent in contemporary geographic thought.

to by Marshall, in which labor and investment freed from the dominance of the lucrative primary processing sectors shift to more labor intensive activities. This is the converse of what international development economists refer to as "Dutch disease;" the gravitation of labor and capital within an economy to a narrow set of lucrative industries, such as oil and minerals, with consequences for stagnation of other industries and loss of economic diversity (Cardoso and Helwege 1993). Finally, we may consider the role of industrial agglomeration processes as drivers of value added development in their own right. Nothing about rural restructuring ensures that restructuring and subsequent industrial shifts will develop in the same location. Locational and industrial change is likely to favor those places that have a prior presence (location) in a growing industry, whether industry clusters or externalizing firms, which form the basis for developing agglomeration economies.<sup>16</sup>

Given these ideas, we can begin to imagine some avenues by which agglomerations might disperse across the landscape of industrialized countries. We might point to the expansion of the urban form, cases of sharp industrial intensification and worker dislocation from within urban territory, and the rise (via technology and personal preference) of truly footloose actors as drivers of rural settlement. That is, we may take urban sprawl, industrial layoffs, and preference migration both as symptoms of

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<sup>16</sup> Most shift-share analyses of industrial change show that the competitive shift component is far larger than industrial mix in accounting for geographical differences in industrial performance. Such findings are concurrent with those that show increasing industrial concentration (see for instance, Beyers 1998). Geographical differences in industrial performance have various explanations concerning differences in regulation, physical endowments, and distance from markets. Of central interest here is the evolutionary theory of industrial development, which suggests that regional differences in performance are attributable to distinct regional trajectories of technological development (Rigby and Essletzbichler 1997).



rural-urban disequilibrium and as causal factors in their own rights that raise the power of agglomeration as a facet of development in the periphery. "Labor set free" from economic cores disperses on the landscape, supporting the progressive development of finer divisions of labor in the periphery.

The foregoing argument hints at a variety of mechanisms through which the general propensity toward agglomeration may shift and disperse. Articulating and measuring such effects is needed, but is largely beyond the scope of this investigation. I present these issues by way of simply observing that the debates on prospects for industrial localization in the periphery have been rather impoverished. Earnest discussion appears to have been limited to the pessimistic globalization view described by Amin and Robbins, the global market fragmentation view suggested by Piore and Sabel, and the technological branching-points view set forth by Scott and Storper. All of these are quite macro in their focus. Needed is research that considers industrial development on a smaller scale; the net effects of global intensification *within* industrialized countries as a realigning influence on large cities and less densely packed spaces. Such a view simply cannot be advanced by considering industrial agglomeration strictly in the context of metropolitan zones and assuming away peripheral development as a realm of routine production.

I have suggested that agglomeration is but one of several interrelated processes of development, rather than a simple obverse of global intensification. The time-honored orientation of economic geographers toward basic export industries helps narrow the list of key processes to agglomeration, urbanization, isolated plant investments, and the

"circulatory sector." I mean this last to refer to a footloose array of retirees, non-locally bound employees, small service firms, and other niche producers that, while a significant basic constituent of contemporary rural economy (Beyers, Lindahl et al. 1995), appears to have limited local means of reproduction; this sector depends on an abiding circulatory flow of finances, information, and other factors from elsewhere.

*Agglomeration is a continuous phenomenon*

I hope that, by now, a few basic relationships between agglomeration and other development forces are evident. One additional consideration to place this study in context is whether agglomeration is best conceived as a categorical effect or a continuous one. I argue that the latter is more appropriate for gauging the prospects for agglomeration as a development phenomenon. Agglomeration effects are well studied in mature districts for the same reasons that evolution is well studied on islands: unique change dynamics are accentuated. That does not mean that agglomeration effects are limited to mature cases. This section suggests some tentative guideposts for understanding in *what* industries, and with what regional scope, we might see rural districts develop. That processes of localization may be seen outside the realm of prototypical industrial districts is implied by some cases that might be considered forms of agglomeration common in the periphery.

Where should we look to observe the role of agglomeration in rural economies? Michael Porter suggests that "being preoccupied with 'new' industries obscures the fact that clusters always represent a mix of traditional and new industries" (1990, 656). Competitiveness and economic renewal in a place – whether a nation, state, or region –

begin not with new industries, but old ones; not with industrial niches booming elsewhere, but in existing or nascent clusters of firms. From here it is a short step to Granovetter's notion of "embeddedness" (1985). Hence the present approach of focusing on industries that have an indigenous basis. This is simply a means of mining for districts, a research tactic for identifying industries with more concentrated potential for localization and agglomeration.

Second, Marshall, in his discussion of industrial shift as an element of restructuring, suggests generalized growth (i.e., external economies) in industries where "the improvements of machinery help us but little." That suggests that we might most profitably look for concentrated growth in high value added natural resource niches, in the realms of labor intensive government, producer, and consumer services sectors.

Third, given a basic orientation toward natural resources, we should be attentive to price-bulk ratios and their fragmenting effects. It unlikely, for instance, that an agglomeration of cabinet manufacturers might rise to global dominance, because the cost of shipping bulky products quickly erodes their profitable reach. While some producers may stake out an expansive niche (as the home furnishings firm Ikea has, for instance, or see: Hansen, 1991), we can anticipate a tendency toward regional redundancy in the localization of high bulk-to-value goods. This is as evident in health care as it is in the manufacture of cabinets and box springs (with the bulk in health care constituted in the conveyance of humans to facilities). Finally, we can anticipate that conditions in home markets will be more critical in high bulk cases (Jacobs 1984; Porter 1990). This topic is further addressed in chapter two.

None of the foregoing is meant to imply that industries that do not conform to these ideas are an empty set of agglomeration effects. A fascinating example is a cluster of manufacturers that produce helmets of all types in Montpelier, Idaho. This tiny town is the dominant center of helmet manufacture in the United States. These guideposts may, however, point to a higher concentration of cases. We might look, for instance, to the rise of orchards in farmland, and centers of wine production from fruit land. Such transformations have something to do with natural conditions of their locations, to be sure. Much depends, however, on the progressive and gravitational effects of such pockets of specialty agriculture on local distribution networks; specialized suppliers of seed stocks, processing equipment, and technical knowledge; workers; and knowledge of crops and markets, which become embedded in local practice and develop as localized systems of production.

We might consider the rapid growth of construction in peripheral areas, and study what segments of that complex have become separated from population centers and attached to industry centers. We might look for changes in production technology that permit organization along industrial lines and, more specifically, seek out process changes that have the externalizing effect of promoting the general growth of the industry. Prospects in this line would include engineered wood products; architectural component and design specialties; manufactured housing; log homes; doors, windows and other millwork. The same could be said for furniture and furnishings.

Many geographers have recognized the distinction between agglomerations that function as localized nodes of expansive, integrated systems versus those that conform to

Marshall's notion of small firm agglomerations (Amin and Thrift 1992; Gertler 1992; Schmitz 1992; Storper 1997). The distinctions are meaningful in the rural Northwest. Food processing, for instance, appears to be more agglomerated in rural areas than do forest products (Vysatova 1997). This may not be too surprising, given that food distribution is far more integrated into hierarchical systems than forest products. Solid wood products tend to be sold into construction markets, a prototypically artisanal specialty. Some molding specialties do, however, appear to have progressed from independent small firm clusters to integrated nodal ones (Braden, Fossum et al. 1997).

### *Concluding comments*

Do contemporary forces, as Sabel (1989) suggests, make possible the reconsolidation of regions as integrated units of production? This dissertation considers this problem in particular reference to industries and spaces that sit outside the urban sphere.

In this chapter, I have outlined the broad context of contemporary debates on flexible specialization and agglomeration. In the process, I have noted that ignoring the periphery has been costly to the state of domestic scholarship. I have identified several questions for which working theories will have to serve. What are the relative roles of general urban agglomeration economies versus industrial organization as drivers of agglomeration? Is present theory sufficient to describe why district-building policy initiatives so often fail? What is the propensity of agglomeration as development process to shift and disperse, and by what mechanisms does it do so? What is the role of

agglomeration relative to other fundamental drivers of economic development? Answers to these questions would require comparative efforts of far greater scope than possible in the present effort.

However, there are questions that *can* be addressed through case studies. To inform how clusters arise, this project will examine the sequence of cluster formation and development. I ask also whether close and frequent inter-firm linkages are, in fact, integral to understanding the genesis and substance of rural agglomerations. If direct local linkages are infrequent, then what more general (exogenous) effects account for innovations in product development, process improvement, and market expansion? I look to the roles of hierarchy within and between firms, to the thickening of these cases as complexes, and to untraded social interdependencies to add greater depth to our understanding of how agglomerations form and function to regional advantage in rural space.

### ***Layout of the dissertation***

The present chapter has set forth the theoretical underpinnings of recent thinking about industrial districts, made a case for research into district formation in the rural West, and identified the research questions in broad terms.

Chapter two details current thinking about agglomerations and develops the expectations that this review suggests for the present research. Research questions are developed in earnest, digging much more deeply into the processes by which agglomerations are thought to form and function. I further mould the theoretical

expectations by reference to the form and trajectory of the industries under study in the rural Northwest. Chapter three outlines the research methods in light of those questions.

Chapters four and five present findings from the two case studies, the layout of which follow the line of the research questions. Both case studies begin by identifying the clusters in the context of their broader industries and regions, then proceed to describes district development, beginning early in the clusters' formation and considering sequences in the development of firms, functions, and district attributes. The third part of each case chapter examines conditions observed in light of the mechanisms by which agglomeration economies are thought to develop, running from conditions to exchange/transaction to more general/exogenous features of the industrial setting.

The final chapter returns to the broader context of economic development in the Northwest periphery. Main research findings are reviewed here with emphasis on the similarities and differences between the cases. The overall findings are compared to prior understanding, and new or expanded views are identified. Questions about broad motive forces of district development, as well as policy implications, are reserved to this concluding chapter.

## **Chapter 2: Literature and research questions**

The previous chapter placed rural agglomerations in the context of the broader discussion on district formation and the general diffusion of people and business establishments. In it I suggested that, first, given the bounty of recent work on the broader topic, little research exists on the contemporary development paths of industry in peripheral areas. Understanding of the role of agglomeration as an endogenous dynamic of relatively rural economies is particularly meager. Second, I made a conceptual link between processes of industrial specialization and population diffusion. If rural regions of the Northwest may reemerge as primary units of industrial production, as the flexible specialization thesis suggests (Sabel 1989), then it seems apt to consider the ameliorative roles of migratory growth, which has been a defining feature of rural development in recent decades (Johnson 1997). This suggests, minimally, that population diffusion should be considered as a mechanism through which processes of industrial specialization extend into smaller places.

Chapter two outlines some major features of the literature on industrial agglomeration, moving from the broader discussion about the role of agglomeration in global development to the specific literature about industrial districts as a growth path for rural places. It concludes with a detailed articulation of research questions. Although a significant contribution of flexible specialization theory is its elaboration of how clusters of small firms in relatively peripheral places generate new competitive advantages



(Schmitz, 1990), the bulk of recent research into industrial agglomeration has concentrated on industrial restructuring in urban (Scott 1986; Gertler 1988; Storper and Harrison 1991; Scott 1993; Scott 1993), national (Glasmeier 1991; Harrison 1994), and international (Porter 1990; Glasmeier and Conroy 1992; Glasmeier, Kays et al. 1993) settings. Ironically, such research reinforces the expectation that rural and peripheral places will continue to play marginal roles in the economy, and moreover, that many industrial investors in the American periphery will shift production to lower cost locations abroad. Glasmeier (1991; 1992; 1993), for example, outlines the real dimensions of these phenomena in high technology and garment industries. Relatively unexamined, particularly in the American literature, is how flexible specialization operates within sectors that are deeply embedded in, and indigenous to, American rural areas, and to what extent flexible specialization presents a framework for examining the development of new, indigenous competitive advantages in rural areas.

At the core of the district formation issue is the proposition that current conditions make possible both the best and worst of regional development outcomes. Benton notes that, "If sweatshops and economic backwardness would result from industrial restructuring in one place, while technological innovation and the revival of craft might emerge in another, *one challenge was clearly to understand the factors responsible for shaping different patterns of industrial change*" (1990, 7, emphasis mine). The challenge for public policy is to understand these forces and, if possible, to positively build upon and influence them. Such a general observation draws its currency from Piore and

Sabel's (1984) proposition, that we are at an industrial divide, at point at which industry development may benefit rural regions *if* policies are appropriately reformed.

The industrial district model anticipates that a nexus of technology and market forces (with debates on their motive force) is becoming so generalized as to make agglomeration a common mode or path of development. Several analyses of district formation cases in the periphery suggest that districts may accrue to other relatively peripheral places; here, small firm districts are seen as models of what is possible and desirable in contemporary economic development (Piore and Sabel 1984; Hirst and Zeitlin 1988; Hansen 1991; Storper 1992). Countering this view is a voluminous, if largely reactive, body of critical literature suggesting that district formation (especially of the small firm variety) is exceptional in the peripheral context (Amin and Robbins 1990; Harrison 1994; Gough 1996; Gough 1996). Critical literature has certainly not lagged in theorizing contemporary industrial change (see, for instance: Harvey 1988; Massey 1995), but much of the recent discourse serves to challenge and refine some highly generalized assertions of neo-agglomeration theorists. It is that clarifying role of critical literature that I will discuss.

### *Locating the topic*

Understanding the form and nature of regions and their industrial economies is crucial to interpreting development (Storper 1987; Porter 1990). The specific cases at issue here are the log home district of Hamilton, Montana, and the marine trades district of Port Townsend, Washington. These industries will be described in chapters four and five. Central to this project is the notion that aspects of change within Northwest region

and the wood products industry have a direct bearing on the prospects for development of districts.

### The Rural Northwest

The primary territory of interest here is the nonmetropolitan, forested zone of the Northwest. By many measures, this territory is hardly industrialized. While pockets of development exist in industries such as producer services and high technology, the economic base of many rural areas remains dominated by forestry and agriculture, retirement and recreation (Beyers 1991; Porterfield and Pulver 1991; US Bankcorp 1994). The region seems to conform to Benton's notion of the "semiperiphery," being newly industrializing and in leadership flux (1990).

Recent waves of migratory growth in rural areas, first in the 1970s, then again in the 1990s (Johnson, 1994; Fuguitt, 1995; Frey and Speare, 1992) have shaped many recent debates on rural restructuring. Rapid and dispersed expansion has brought into question two dominant expectations about domestic rural development: (a) population will continue to *concentrate in cities*, and (b) industrial change is best described by reference to processes of *globalization and industrial exit*, embodied in the closure of primary processors, the downgrading of work, and price pressures on natural resource producers (Frey and Speare, 1992). Some regional analysts have framed an alternative thesis of Northwest regional development. They suggest that waves of recent immigration are defined by lifestyle and amenity preferences and are the major force of change in the rural Northwest (Power 1996). This is consistent with the deconcentration interpretation of migration, which reads rural growth as a product of intersecting forces of

communications technology, general rural amenity pulls, and selective urban pushes (Frey and Speare 1992).

Policy experiments with district building (flexible manufacturing network) initiatives in the Northwest were launched in the context of rural community distress, which was characterized by the downsizing and exit of many timber and primary wood products producers. Beginning in 1989, public policy leaders at the state and local levels in this region implemented a wave of public and quasi-public sector (network or multi-firm collaboration) revitalization strategies. These were intended to foster economic development within industry clusters (Lichtenstein 1992; Rosenfeld 1992; Fossum 1993; Rosenfeld 1993; Rosenfeld and Bosworth 1993; Malecki and Tootle 1994). Such strategies often took organic (i.e., not policy induced) clusters of manufacturing firms as their starting points. In spite of early and measurable successes (Rosenfeld 1993), most of these network development experiments have since failed or faded into the margins of economic development policy. Among the reasons are weak institutional support. As economic development initiatives, they were poorly funded and worked within state policy environments that were hostile or indifferent to them. Yet, as Harrison (1994) has observed, promoters of multi-firm networks as a public policy strategy tended to proceed without much understanding of the form and function of the clusters that are at the foundation of these district building efforts. The initiatives raced well beyond their promoters' understanding of what works, where, and why.

Despite such failures, I argue that the prospects for industrial formation and district development may be heightened by current conditions in the Northwest. Two

issues are especially pertinent to my argument. First, the tendency of agglomeration effects to diffuse to peripheral locations may be enhanced by expansion of the urban form. The growth and spread of cities is well illustrated in the experience of the largest metropolitan areas, but these effects have not, in recent years, been limited to only the largest places. Urban spread is today evident around even sub-metropolitan cities of the Northwest, especially in its forested parts (Fossum 1997). The simple point I advance is, the dilation of cities into the countryside expands the zone of intersection between urban economies and formative industry clusters. That is, the role of cities as seedbeds for industrial formation and growth might enhance the prospects for districts in historically rural locations.<sup>17</sup> This is in addition to more general effects of transportation and telecommunications advances that enable agglomeration economies in progressively less densely settled areas (Wardwell 1980). That is, features of settlement may be read as raising external and urbanization economies, both of which are prime factors in industrial development.

The second point is closely related and concerns the growth of population *qua* markets in rural territory. It is axiomatic that, as markets increase in extent, the limits to divisions of labor and industrial specialization diminish. Prior contributions in the flexible specialization literature, for instance, have emphasized global market expansion and fragmentation as driving forces in the proliferation of district forms (Piore and Sabel 1984). This position, however, is problematic in wood products specialization, because

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<sup>17</sup> Fringe effects have been discussed by Scott (1983; 1983; 1984; 1990). He observes sub-districts of component producers in fringe-city locations; intra-metropolitan differentiation within districts yield the

market proximity is important to specialization (Polzin, Connaughton et al. 1992). In such industries, market growth embodied in high rates of net in-migration may be more important than expanded market reach to differentiation of wood products.

*Table 2.1: Population and Migration in Northwest Counties, by Place Size, 1980-1994*

County groups	Population	Total net migration & annualized rates of migration			
	1994	1980 - 90	Annual rate	1990 - 94	Annual rate
Major Metro	3,747,372	310,377	0.95%	129,459	0.88%
<i>Central Counties</i>	2,199,234	130,580	0.65%	6,602	0.08%
<i>Fringe Counties</i>	1,548,138	179,797	1.43%	122,857	2.09%
Minor Metro	3,181,333	90,737	0.32%	177,753	1.45%
Larger Nonmetro	1,933,578	-28,693	-0.16%	119,427	1.61%
Mid-sized Nonmetro	1,270,587	-47,226	-0.40%	64,395	1.31%
Most Rural	285,437	-13,455	-0.50%	17,190	1.56%
All Northwest	10,418,307	311,740	0.33%	508,224	1.26%

Source: (Fossum 1997), data: Regional Economic Information System

*Table 2.1* illustrates population growth in the rural Northwest. It shows population and net migration growth from 1980 to 1994, aggregating counties in four Northwest states (Washington, Oregon, Idaho, and Montana) by place size.<sup>18</sup> As of 1994 about one third of the region's population was in nonmetro counties, and the majority of this population was concentrated in counties with smaller (sub-metropolitan) cities. Annualized rates of migration shown here illustrate the remarkable reversal in net flows of people between this decade and the last. Migration growth was strongly associated with place size from 1980 to 1990, with larger places growing fastest. In recent years,

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benefits of lower cost. The point here is that urban expansion may imply a spatial enlargement of potentials for new district formation.

<sup>18</sup> The urban-rural continuum codes reflected in Table 2.1 were aggregated by place size to ignore the effects of metropolitan proximity, except in the case of major metro areas (population over one million). Core and fringe counties of Major Metro areas are inset under that heading. The Fossum (1997) analysis concluded that, because fringe effects of in smaller metropolitan counties of the Northwest are similarly observed in many of the region's sub-metropolitan cities, the core-fringe distinction is not meaningful except around the largest cities of the Northwest.

rates of migration growth increased, shifted away from the largest urban cores, and nullified the prior association between size and growth rate. Two additional features are not visible in this table, but are visually discernible on migration maps (see: Fossum 1997): (a) nonmetro growth is concentrated around smaller cities, and (b) the fastest growing rural areas are mountainous and forested (as opposed to the slower growth and decline in plains/agriculture regions). In all, the evidence indicates both urban spread and diffusion of population, both of which may be expected to increase industrial specialization in specialty wood products in the Northwest.

### *The Wood Products Industry in the Northwest*

In conceptualizing the geography of wood products, it is useful to imagine primary wood products production (mostly lumber) and final consumption (mostly construction) at opposite poles. Wood begins in the forest and ends in the building, with interim stages of processing along the way. One issue is *where* forests, markets, and interim stages are located. A second issue is *why* differences in growth and decline occur at various points between forest and final consumption. Of interest is that primary wood products production is dominantly organized along Fordist lines of factory production, and has been subject to relentless pressure to increase productivity. Construction and many other downstream processing specialties are organized along craft lines (Piore and Sabel, 1984, for example, present construction as a quintessential example of a craft industry; Pollard, 1996, defines "variety based" industries to include furniture manufacturers). Considering which interim stages of production cross over between

factory and craft forms, may be fruitful, for the shift signals differences in form and function that help us anticipate their locational possibilities (Storper 1997).

The forest products industry in the Northwest is in a period of restructuring. Since about 1980, rounds of technological intensification in primary wood products processing coupled with environmental and policy pressures have brought adverse changes to firms and citizens of those rural communities traditionally reliant on forest products for employment (Brunelle 1986; Fossum 1993). Today, however, wood products manufacturers that have concentrated on commodity production appear to be diversifying into new, and more specialized, products and markets (Fossum 1994).

Consider exports as an indicator: as regional exports in primary wood products commodities groups have weakened, exports of secondary and value added wood products have risen sharply, more than tripling between 1989 and 1996 (Dirks 1994; Braden, Fossum et al. 1997).<sup>19</sup> While the rise of secondary exports in this period in no way replaced the dollar value of declines in primary exports, the appearance of a *shift to secondary exports* raises questions about why and how this occurred. In particular, it seems to present an interesting challenge to Amin and Robbins (1991), who anticipate that industrial restructuring will put economies on a path of industrial flight and

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<sup>19</sup> Following (Braden, Fossum et al. 1997), primary wood products industries are defined to include sawmills and planing mills (SIC 2421, 2429), hardwood dimension and flooring mills (2426), plywood (2435, 2436), and reconstituted wood products (2493). Secondary wood products industries include millwork (2431), wood cabinets (2434), structural wood members (2439), boxes, pallets, and other containers (2441, 2448, 2449), manufactured housing, prefabricated wood housing and components (2451, 2452), misc. wood products (2499), and several categories of wood furniture (2511, 2512, 2517, 2521, 2531, 2541, 2599).



community ghettoization. It would appear that contemporary change in the wood products industry entails both creation and destruction.

Growth in construction provides a view of the wood products industry from the perspective of domestic consumption. Regional demand evidenced in building construction is of particular interest given the thesis that population growth may drive market growth and afford finer regional divisions of labor in wood products. Secondary wood products production, as typically defined, is a small fraction of the size of primary wood products (Braden, Fossum et al. 1997). When construction is included in secondary wood products, however, the balance changes entirely.<sup>20</sup>

*Table 2.2* portrays the size and recent growth trajectories of two major facets of wood products industries in the Northwest: primary wood and paper processing, versus construction, building materials, and furniture manufacture. The figures indicate that construction and affiliated industries were, in 1990, substantially larger than primary wood and paper processing. Primary wood and paper production exceed the size of the

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<sup>20</sup> Construction, of course, entails much more than wood work, which is one reason it is commonly excluded from categorization in wood products. I suggest that construction is a prominent aspect of the wood products complex, and is helpful to understanding the geography and development of the industry. Moreover, the integration into construction of non-wood work is part and parcel of the way that sub-sector is organized, along craft lines. It is a small point, but has proven a dilemma for this project. In the marine trades case, wood craft is integral and historically crucial, but is not the main part of the picture. There is a parallel dilemma for economic development strategy, because (to paraphrase Porter, 1990, p. 656) being preoccupied with wood products can obscure the fact that growth and development always represent a mix of wood products with other industries. Boosters preoccupied with developing new wood products industries, as well as those who target entirely "new" industries, define a regional primary products consumers of out of the equation.

construction industry only in Oregon, the most wood products dependent state in the region.)<sup>21</sup>

*Table 2.2: Wood products industry, size and growth in the Northwest states*

	<b>Paper and Primary Wood Products Manufacture</b>		<b>Construction, Building Materials and Furniture</b>	
	<b>1990 Income (000)</b>	<b>1990-94 Annual growth</b>	<b>1990 Income (000)</b>	<b>1990-94 Annual growth</b>
Idaho	852,658	8.3%	884,373	13.1%
Montana	304,825	4.1%	451,826	14.5%
Oregon	2,554,258	1.7%	2,410,273	9.0%
Washington	2,143,513	2.7%	5,007,224	6.6%
Northwest	5,855,254	3.2%	8,753,696	8.4%

Source: Regional Economic Information System, analysis mine.

The table also provides annualized rates of growth from 1990 through 1994, a gauge of the different growth trajectories of these facets of the wood products economy (while the years could bear updating, the broad picture would be the same). Primary wood processing, at 3.2 percent, generated modest income growth (slower than the 3.8 percent growth in all manufacturing), while construction, building materials, and furniture grew at a rapid pace. The picture is even more extreme when employment is considered, because total employment in primary wood processing actually declined in this period (Braden, Fossum et al. 1997, p. 12). These findings generally are consistent with Power's (1996) thesis, that the up-side of restructuring in the region's wood products industry is driven by population growth.

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<sup>21</sup> Within these figures, construction proper accounts for 85 to 90 percent of the totals summarized here, while furniture manufacture contributes a modest 1 to 3 percent of the total. Primary wood processing (excluding paper manufacture) accounts for a similarly large share of that category, 62 to 88 percent. Hence, the same that has been said of the aggregations shown here is true for the major subcategories: construction generates substantially more income than primary wood products milling. Note also that the base year figures are comparable: in 1990, both housing starts and timber harvests were in slump, both having fallen from a higher plateau in the late 1980s (Braden, Fossum et al. 1997).

Transportation cost analysis is important in locating potentials for development of high-value wood products specialties along the production chain that links forest and final consumption. Polzin, Connaughton, and McGinnis's (1992) analysis of location of "value-added" wood products illustrates the power of population alone in predicting the location of high-value production. Their model tends to confirm that wood products with high weight-to-value ratios will tend to be produced nearer population centers. This gravitational effect of markets is a potent principle and should not be dismissed lightly. However, the state-level aggregations used in this study ignore a whole slate of alternative effects that may bear on the spatial shifts and evolutionary flows that may be crucial to understanding the nature of development. Strange et al. (1990) point to just such forces in their comparative analysis of economic development potentials at the community scale. They find that the most resource dependent communities are far less successful than their more diverse counterparts at generating outside investments and diversifying into other industrial sectors. The more narrowly reliant upon natural resource production a community is, they find, the less its chances of doing otherwise, regardless of its nearness to population centers.

While Strange et al. do not enumerate the structural alternatives in any way, they hint that factors other than simple distance from markets may account for difficulties some rural communities have diversifying. Among these other factors are "Dutch disease," the gravitation of labor and capital within an economy to a narrow set of lucrative industries (Cardoso and Helwege 1993). A related notion in agglomeration theory points to a shortage of alternative internal or external economies (i.e., beyond

those that bear on farm or forest commodity production) (Oughton and Whittam 1997). In addition to strictly economic factors, the presence in resource dependent communities of a “commodity milieu” may restrict development potentials. That is, established skills, interests, institutions, and leaders help lock one-industry towns into a limited set of potential futures. Transportation cost theory may account for the broad place of high value wood products production, but aspects of the industrial milieu (Crevoisier 1993) may be important to understanding the how and where of variations in the location of wood products specialties along the forest-market vector.

The findings just reported appear contradictory. Is recent growth in secondary wood products production merely a tertiary effect, a subsidiary impact of regional growth and dispersal of population, as Power (1996) suggests? That seems plausible, but then what accounts for the apparent compensatory shift of exports toward secondary wood products observed by Dirks (1994)?

A starting point for nearly all of the recent agglomeration literature has been the proposition that agglomeration and district formation are generated by dynamics *within* the industries themselves. Such a reading permits us to consider district formation in terms of adaptive response. What is being observed are unrelated adaptations by wood products producers and workers that need to squeeze more work from less wood. That general imperative, driven by primary restructuring, instability in wood sources, and concurrent population diffusion, has raised the pace of creation and destruction in the wood products industry, and the result is an evolutionary shift toward the faster growing parts of the sector, secondary and finished wood products. While some adaptations are

apt to be fleeting, lasting only so long as timber is scarce, for instance, some new firms will settle into stable new niches, and some workers will develop new skills and jobs that use them.

Agglomeration theory suggests, first, that clustered firms are at an adaptive advantage, and so helps us understand which points on the forest-market vector grow and which decline. Second, it suggests that agglomeration effects move clustered firms down a similar evolutionary path, and so helps to account for regional specialization.

Theories of economic development also provide a conceptual linkage between conditions in “home” (i.e., regional) markets and developing export performance. Jane Jacobs suggests, in her theory of import substitution (1984), that advantages developed in home markets create base advantages from which competitive reach may be extended. Porter (1990; 1996) develops this farther to refer to the quality (not just the extent) of home market demand. He suggests that the demands placed on industry by *exacting* regional consumers hones the edge of the home-grown industry and yields advantages that can extend into more distant markets.

Could such effects be at play in recent export secondary wood products performance? Again, it seems improbable that the recent growth in home markets would so quickly be reflected in the development of new exportable advantages. Consider one last bit of evidence. In a recent survey of Washington’s secondary wood products employers (Fossum and Sommers 1998), regression analysis revealed an intriguing relationship between principal market focus and employment growth. Those secondary wood products firms that had added jobs (i.e., expanded) most often reported a focus on

regional markets; but those that reduced total jobs tended to report greater reliance on export markets *or* highly localized ones.<sup>22</sup> This point-in-time image of producers thriving in regional markets while struggling in local and distant markets suggests that the rush to secondary exports has proved difficult for many producers. Developing advantages in higher value wood products may depend on regional markets and the processes of import substitution outlined above.

Turbulent conditions in the industry may have opened windows of opportunity, or necessity, in which new industry clusters may emerge and develop the attributes of districts. Because final wood products construction industries are, dominantly, organized as along craft lines, regional market growth in secondary and finished goods makes it likely that there is a proportional shift in the organization of production, away from routinized production, and toward craft production. Some evidence does indicate that specialization is occurring in the form of clusters of wood products manufacturers. A significant concentration of log home manufacturers, for instance, has grown up in western Montana; boat builders in Port Townsend; Washington; furniture makers in southwestern Oregon; engineered wood products producers in southwestern Idaho; and architectural component specialties in the South Puget Sound area of Washington.<sup>23</sup>

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<sup>22</sup> The survey was conducted in August and September 1997 and asked about performance within the prior year. The broad Asian recession that subsequently dampened markets there were not then a major role. It seems unlikely that the observed effects are wholly attributable to downturn in export markets.

<sup>23</sup> Early in the project reported here (Braden, Fossum et al. 1997), analyst John Dirks constructed a database of Northwest secondary wood products firms by county and SIC codes. That database was used to identify clusters of similarly specialized firms, and informed the selection of cases for detailed analysis both in that paper and the present dissertation. The project did, in fact, identify numerous concentrations of like secondary wood products firms – clusters – for which no further analysis was undertaken. Unfortunately the database and analysis were subsequently lost in a computer problem. All that remains of

I turn now to theory about how industry clusters are thought to develop, what roles hierarchy and collectivity have in their function, and the fundamental underlying forces that may (or may not) make industrial districts a development path of rising importance in the rural Northwest.

*The contemporary debate about industrial districts*

The literature review about industrial districts begins with research on industrial districts in general and then about rural and peripheral places. Industrial activities are not randomly distributed in space but develop in accord with social and locational advantages. A set of key questions concerns how and where the concentration and specialization of industry takes place. I earlier proposed a simple theory of district development that identifies location, externalization, and agglomeration as distinct processes, each with its own spatial logic and theory. The path of district formation includes these dynamics in rough sequence.

Recent research on agglomeration has elaborated district dynamics principally in relation to processes of innovation and market change. Technological and process change, in particular, have been examined to discern the *transactional logic* of contracting and inter-firm divisions of labor, especially as that may accentuate regional specialization (Scott and Storper 1987; Storper and Christopherson 1987). Market change likewise has been linked to a logic of inter-firm relations, and *cooperation* has

been added to more institutional notions of *collaborative* economies (Piore and Sabel 1984; Sabel 1986; Sabel 1989).

With increasing specificity, proponents of agglomeration as a likely path of regional development have contended that the agglomerative (or other) economic character of a place cannot simply be inferred from the features of its industries, rather the extent and form of agglomeration are significantly determined *in the local setting* (Granovetter 1985; Crevoisier and Maillat 1988; Storper 1997). The evolution of what Alfred Marshall called the *industrial atmosphere* has become central to theorizing the myriad expressions of market, hierarchy and collectivism that are thought to generate dynamic advantages within districts. In essence, thinking about industrial districts has moved far beyond the early theory of districts, which held most benefits to proximity to be incidental (e.g., better market access, suppliers, and workers). Contemporary theory emphasizes the roles of conscious agency in the dynamics of industrial districts.

### Theoretical Roots and the Main Streams of their Development

The idea that there are efficiencies in clustering can be traced to Alfred Marshall's theory of external economies. External economies are those that do not fully incorporate the costs and benefits to economic agents and so favor general industry growth (externalization) over the massing of benefits within the firm (internalization). Moreover, external economies "can often be secured by the concentration of many small businesses of a similar character in particular localities" (Marshall 1925, First Edition 1890). The benefits of external economies, then, are not limited to groups of small, clustered firms, but are "often secured" by them.



As discussed in the previous chapter, Marshall's external economies may be reduced to three major types: pecuniary, exogenous, and collective economies (Oughton and Whittam 1997). The first appears to have least association with geographical clustering: competition drives down the cost of goods, to the (external) benefit of downstream purchasers. The others bear more directly on proximity. Exogenous economies include such issues as plentiful skilled labor, infrastructure, and industrial atmosphere, all of which may have the character of public goods. Collective economies arise when groups of firms pool certain costs, reducing barriers to entry via formal agreements and institutions.

The parallel theory of agglomeration was advanced by Alfred Weber (English edition, 1929) who makes clear that his focus is location, specifically the *social* factors that give rise to the *concentration and deconcentration* of industry. Compared to Marshall's focus on whether or not economies could be internalized by the firm, Weber's principal concern is the human dimensions of industrial localization. Weber suggests agglomeration economies may mature into diseconomies and affect deconcentration.

Beginning in the early 1980s, multiple streams of scholarship began to reassess industrial dynamics in ways that placed the role of regions at the center of debate. Building on the foundations of the work of Marshall and Weber, at least three schools of thought in geography have reasserted districts as a definitive path of industrial development and the region as a primary locus of industrial organization.<sup>24</sup> The flexible

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<sup>24</sup> The resurgent interest in districts is well represented in management sciences, economics, and sociology literatures. A detailed discussion of those as separate literatures would be of limited value. The present

specialization school (Brusco 1982; Piore and Sabel 1984; Hirst and Zeitlin 1988), focused on the rise of small-firm districts in the context of an institutionally rich, activist regulatory setting. The francophone GREMI (*Groupeement Development Recherche Europeen sur les Milieux Innovateurs*) school (Camagni 1988; Crevoisier and Maillat 1988) focused on the evolutionary qualities of innovative milieu, theorizing that, in conditions of agglomeration, proximity is functional to technical know-how, institutional learning, and industrial dynamism. The California school (Scott 1984; Scott 1986) described the transactional logic of shifts from integration to disintegration and from old industrial centers to new, and did so in the liberal and minimally institutionalized setting of southern California. As the discourse on these and other streams of research has advanced, cross-pollination between them has resulted in blurring the distinctions of each. It is increasingly problematic to call out one of these schools in isolation (as several critiques have, see Amin and Robins 1991; Gough 1996; Markusen 1998).

From early on, case-studies of district phenomena have also had a less sanguine counterpart. In general, this critical line of research tends to concur with the proposition that the classical Fordist-Taylorist forms of industrial organization (which rely on scale, standardization, and integration) have come into crisis (Harvey 1988). This literature maintains that this crisis has engendered new variety in the forms and paths of development, but that it is premature to conclude that a singular alternative mode of social regulation is ascendant (Amin and Robins 1991; Tickell and Peck 1992).

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review incorporates selected contributions from these fields, but limits discussion to key influences they have exerted on the regional sciences literature. For a review of these streams in context, see (Gertler

This critical body of research work has advanced flexibility as an overarching theme of current industrial change. Flexibility refers to diverse tactics of accumulation at the firm level, including flexible relations toward workers and contractors, flexible machine and inventory management, and growing mobility of capital between spatially divided subcontractors (Gertler 1992). Some recent analysts have linked the neo-agglomerationist literature to this notion of flexibility and argue that it is overly broad and fuzzy (Markusen 1998), but the point is poorly placed. While flexibility was an early theme of the flexible specialization literature (Piore and Sabel 1984), that focus has waned with evidence that flexibility is distinctive neither of industrial districts nor of dynamic high technology industries (Gertler 1992; Storper 1997). According to Malecki, "industrial districts may or may not be flexible; what they are for certain is agglomerated" (1995, 12).

### Main Currents in the Thesis and Theory of Industrial Districts

The recent discourse over industrial districts is not embodied in a single corpus of theory. Debate over what forms of industrial organization are ascendant (if any) amounts to a provocative argument about the form of, and options for, contemporary industrial development. A range of theoretical perspectives have been brought to bear on the debate about industrial prospects, and these reflect competing *theses* of development. A prominent cleavage in this discourse is the thesis that industrial districts represent an

increasingly common, possible, and desirable development path, versus the antithesis that they do not.

What bears elaboration now are areas in which neo-agglomerationist scholarship *has* made distinctive contributions to theory. The idea that regional development is shaped by local industrial dynamics is the starting point for theorization of contemporary industrial districts. Innocuous as this may seem, it represents a break from some recent predecessors to district theory, which tended to focus on more general attributes of place. Earlier seedbed theory, for instance, examined how certain attributes of urban scale confer agglomeration advantages (Struyk and James 1975). The intellectual progeny of this approach was evident in rural revitalization circles in the widely received idea that "support for the local business community" was crucial to the successful revitalization of rural communities in the American heartland (John, Batie et al. 1988; Luther and Wall 1989; Luther and Wall 1989). Neo-agglomerationists suggested that enumerating location attributes (i.e., airports, freeways, industry parks, research institutions), much less cataloging communities' acquiescence to business interests, is of limited practical value to the fate of regions (Scott and Storper 1987). In the recent literature, assumptions of directionality are largely reversed.

In recent years, efforts to theorize agglomeration have been directed rather exclusively to the role of districts as engines of innovation and export advantage (Gertler 1992). This excludes many types of agglomerated industries that were specifically included by Marshall (1925). For instance, vendors, confectioners, carpenters, and other common craft cases that derive from the general urban conditions have been wholly

disregarded in most recent studies. This reflects underlying assumptions that can be problematic: that there is a crisp, functional distinction between locally and globally-oriented districts; and that features of global markets are of central importance to understanding firm dynamism and the nature of contemporary competition (Phelps 1992; Harrison, Kelley et al. 1996). While it may have overshoot its mark, the choice of export effects as benchmark of significance does seem to have moved the discussion into productive territory. The cost of excluding local-market districts, however, is that there has been limited progress in understanding the role of "home" effects in developing regional advantage, which may be crucial to understanding agglomerations in some cases, including situations where products of high bulk-to-value raises the difficulty of penetrating distant markets.

The substance of recent theoretical development may be seen in the elaboration of two doctrines that attempt to elucidate how, when, and where the course of development runs toward externalization and regional formation: flexible specialization, and the California school.

### **Flexible Specialization and the Logic of Cooperation**

Specialization among clusters of small firms in the Emilia-Romagna area of Italy was described by Brusco (1982) among others (see Benton, 1990), and theorized at the international scale in the seminal work of Piore and Sabel (1984). More than any other single contribution, *The Second Industrial Divide* incited an intense debate over contemporary industrial form in space. It suggested that Fordist mass production was in crisis, and that competitive renewal was possible and desirable through the renewal of

district forms of production, and particularly through Marshallian districts of small firms. The line of thinking that emerged from this is generally referred to as *flexible specialization*.

The thesis of this school is that industrial districts are today a possible and desirable path of industrial development. In essence, flexible specialization holds that contemporary crises and decisions of business and public policy makers can generate local competitiveness through disintegration of the firm and decentralization of production. At this historical moment, an industrial divide may be crossed, from Fordism with its mode of social regulation largely rooted in the national scale, to district formation and regional regulation. Central to the thesis (though in the end, highly problematic) is the broad expectation that product life cycles are becoming shorter and markets more fragmented, fostering smaller batch production, the automation of production, greater skill and responsibility placed on the labor force, and the rise of high speed, low inventory contracting practices. Proponents of the flexible specialization thesis anticipated that these broad shifts would favor craft production and a resurgence of regional advantage over Fordist production and integrated industrial centers (Piore and Sabel 1984; Brusco 1990; Schmitz 1990).

The *theoretical* refinements to Marshallian thinking are distinct and significant. First, Piore and Sabel challenge the idea that the impulse to internalize and expand (i.e., to grow the firm) is dominant always and everywhere. They suggest that industrial development does not move inexorably on a path toward greater scale and integration, it can be the other way around, toward smaller scale and disintegration. Firms exercise

limited control over industrial economies, and even to the extent of their control, they must fashion a strategic balance between internal gain and risk. Factors affecting the balance include input supplies, demand, technology, time-to-market imperatives, product development cost, labor politics, know-how and organizational problem solving (Camagni 1988; Saxenian 1991; Crevoisier 1993; Pedersen, Sverrisson et al. 1994).

Second, Piore and Sabel expand upon the district as a logic of production, adding cooperation to Marshall's slate of collective economies. Collectivity is not expressed merely in incidental forms, as in public institutions. Cooperation, alliance, and reciprocal norms constitute collective economies too. This represents an earnest augmentation of prior theory about districts (Harrison 1992). While care must be taken not to over-imagine this more expansive conception of collective efficiencies as banishing the roles of competition and rivalry between firms (Porter 1990), the general notion that cooperative dynamics are distinct and present in the form of community norms and formal joint ventures has withstood critique and been integrated into Marshallian terminology. The research project of Hubert Schmitz, for instance, redefines Marshall's collective efficiencies more expansively, in reference to the competitive advantage gained from *local external economies and joint action*, a definition that identifies both planned and unplanned, incidental and purposeful advantages of clustering (1995). Michael Storper develops the same basic principle as untraded interdependencies (Storper 1997).

Third, the theory suggests that industrial districts feature certain practices of learning that become embedded within a district form, such that agglomeration becomes

cumulatively caused (Granovetter 1985). The direct implication for theorizing district formation is that the competitive advantage of enterprises can not be understood in isolation from the more general social setting. The essential facts of industrial competitiveness lie in the spaces between, in institutions, transactions and relations that make up the social backcloth of the *industrial milieu*.<sup>25</sup>

The theory suggests that purely economic variables (price, quantity, materials, labor) diminish in their capacity to account for the evolving district. Through the Shumpeterian process of creative destruction, other features (political and administrative organization; community life; information, reputation, and know-how; and labor training and organization) acquire a more determining role (Pedersen, Sverrisson et al. 1994; Saxenian 1994; Crevoisier 1996). A more expansive way of saying this is that a regional mode of social regulation, characterized by the district, emerges and becomes relatively stable. This notion has been subject to challenge from regulation theorists (Tickell and Peck 1992), and will be returned to below, but the underlying idea, that institutionalization emerges in an evolutionary process of embedding that is key to understanding the formation and development of districts, has retained its currency (Scott 1995; Scott 1996; Storper 1997).

Granovetter's (1985) treatise on embeddedness marks a point of separation for a line of thinking about industrial milieu that is in many respects distinctive from flexible

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<sup>25</sup> This line of thinking has been carried forward, notably by a francophone school of researchers under the GREMI umbrella (see, for instance, Camagni 1988; Crevoisier and Maillat 1988; Crevoisier 1993), and in development thinking in the northern European periphery (see: Malmberg 1996). Although its theoretical contributions concerning a *logic of iteration* between regional and industrial development are distinct from



specialization. This reasoning suggests that district formation and development is not *like* an evolutionary process, it *is* an evolutionary process in which certain types of places (innovative ones) have an adaptive edge. Such places tend to leverage regional specialization from macro-level rounds of integration and disintegration, and hence the theory speaks to both large and small firm district cases. The notion of milieu has been carried forward and reintegrated with thinking about industrial districts and regional development (Hansen 1990; Hansen 1992; Harrison, Kelley et al. 1996; Scott 1996), and is evident in the current focus on technological learning (Storper 1997; Glasmeier 1998).

The contributions of the flexible specialization school have been a subject of extensive critique and refinement. In the process, it has become clear that the thesis predicting regional resurgence of small-firm districts is much less general than had been proposed by Piore and Sabel. Macro-level changes in markets and processes that favor shorter production runs and greater customization (i.e., flexibility and specialization) exist, but by no means do these things mean the eclipse of older, integrated firms and their centers. The term flexible specialization appears, in this respect, most apt as a period description in which agglomerated industrial development is possible, but in many places certainly not dominant. Notwithstanding this, flexible specialization persists as a term of reference to the theory of industrial districts, especially new- and small-firm ones. Most current contributions, however, specify agglomeration more directly.

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flexible specialization in many respects, I treat it here as of-a-piece with that literature. For a critique and reconceptualization of the idea of industrial milieu, see Storper, 1997, especially pp. 16-18.

Several scholars have directed criticism to one of the most implausible expectations of the flexible specialization thesis: that large, integrated firms are, as a class, fatally unable to take advantage of market fragmentation and flexibility of production. A significant stream of research has focused on the evolution of established and maturing centers, and particularly centrifugal and centripetal dynamics that reshape them. As Bennett Harrison (1994), Meric Gertler (1988) Ash Amin and Nigel Thrift (1992), Richard Florida (1995) and others have noted, large integrated production firms are far from dead. A prominent line of continuing research has examined whether flexible specialization is a general and global force of change, particularly among mass-market manufacturing industries, and the evidence on this score is decidedly mixed (Gertler 1988; Schoenberger 1988; Scott 1993; Scott 1993; Harrison 1994). While it is broadly accepted that business managers are attempting to introduce principles of flexibility in response to the crisis in Fordism, it appears unlikely that the main effect is the resurgence of agglomeration economies and industrial districts. Very broadly, the view posited in its place presents industry centers, some quite agglomerated, functioning as command and innovation centers of globally expansive hierarchies.<sup>26</sup> To frame this in terms of Piore and Sabel's metaphor, an industrial divide may exist, but many regions have not crossed it (Storper 1997).

Another problem with the flexible specialization thesis is that it asserts sharp lines between mass and craft production where fuzzy ones exist. The use of flexible

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<sup>26</sup> The problem with this critique, as I have argued before, is that it limits fine distinctions to understanding major established cores, and chalks off the balance of territory with a bland version of dependency theory.

technologies by major manufacturers to automate and customize blurs the distinctions between mass production and flexible specialization and becomes less and less applicable (Sayer in Schmitz 1990).

Attention to evolving industrial centers accentuated a distinction that was asserted but little developed in early formulations of flexible specialization theory, between large-firm districts and small. Marshallian industrial districts speak specifically to conditions of small firms in clusters, which are quite distinct from the classic contemporary image of industrial cores, dominated by a few major firms. Hubert Schmitz (1990) draws the distinction between *large firm* and *small firm variants* of flexible specialization, and that distinction is honored in most current work (Storper 1997).

Processes of maturing large firm-led agglomerations are of little immediate concern to this study. It is sufficient to conclude that research has shown historic centers of Fordist production to be quite adaptive. Moreover, the question about whether dynamics of industrial globalization and spatial divisions of labor are significant forces in contemporary industrial change has been definitively answered: they are (Florida 1995).

What are the implications of these processes for the industrial periphery? The focus on the old industrial centers as driving the formation of new ones favors the conclusion that product cycle dynamics account for industrial development in rural and peripheral zones (Amin and Robins 1991). In this regard, some researchers have gone off on the opposite tangent, veering away from the implausible notion that the future is bright for a world of small, quasi-democratic districts, to the equally doubtful one that development of *new* industrial spaces will be an immediate reflection of development in

old ones. From here it is a small step to the expectation for rural prospects, that regional structure and initiative matter less, not more.

A basic problem with this view is that it makes big assumptions about precisely *where* globalization under flexible management is a significant dynamic of change. In particular, it supposes that the highest toll is exacted in the periphery, while the opposite may be true. As I pointed out in the first chapter, global industrial restructuring is a feature of rural economies so longstanding that many places have relatively little of their old industrial concentrations left to lose. What may be new is the rising role of industrial intensification and exit *in larger urban settings*. The net effect may be to contribute to the flows of migratory growth toward a diffusion of population and general rural growth, with all the implications that has for industrial formation and specialization in the periphery. Regional population change should not necessarily be thought of as an equilibrating effect, offsetting the primary role of industries as global command structures, but rather as a different dynamic, the extent and distribution of which need to be addressed if we are to understand the nature of rural change.

How are the classical districts of the small firm producers observed in flexible specialization research accounted for under the critical literature? One often-cited view suggests that the well-studied Italian, German, and Danish cases owe their existence to deep historical roots and not to the intersection of broad contemporary forces with favorable local norms and institutions. Marshallian small-firm districts are, in a word, rare (Amin and Robbins 1990). Both of these points, about general rarity and historical specificity, have induced Michael Storper (1997) to call the small-firm district debate "ill

fated." Too soon, I think, for this view fails to account for the huge proportion of smaller firms, or accounts for them rashly as either marginal freelancers or as firms under the economic thumb of global operators. Lacking more careful empirical backing, it seems to foster an arbitrary description of large firm led cases as common/contemporary while small-firm districts are deemed uncommon/antique. While a great deal remains to be known about small firm districts, recent research supports the conclusion that contemporary small firm industrial districts are not simply historical remnants that are still hanging on, but are actively constructed in the context of broader economic change (Glasmeier 1994; Pedersen, Sverrisson et al. 1994; Saxenian 1994; Schmitz 1995; Scott 1995).

Some researchers have tackled the knotty empirical problem of measuring the prevalence of industrial districts. Of those cities that have seen disproportionate growth in manufacturing, for instance, it seems clear that there are a number of development forms outside the classical district. Markusen (1996) names hub and spoke, satellite platforms, state anchored towns, in addition to Marshallian districts, as characteristic of American cities with high manufacturing growth. Other empirical examinations of this nature (Luria 1990) have cast doubt on the notion that Marshallian districts (especially those laced with collaborative habits and institutions) are on the rise generally. A related bit of evidence shows that *variety*-based manufacturing (i.e., the specialization part of flexible specialization) does not appear to be subject to a positional change of output or employment, as the flexible specialization thesis would lead us to expect – that is,

industries historically characterized by variety in production are not growing faster than others (Pollard and Storper 1996).

This evidence, however, is partial and tentative. The flexible specialization thesis, relying as it does on micro-scale information about internal management and qualities of relations between firms, is not very amenable to aggregate statistical measurement (Schmitz 1995). Markusen's (1996) rediscovery of government and company towns can, at most, temper the most optimistic interpretations about the role of Marshallian districts. While Pollard and Storper (1996) find no net growth in variety-based industries, they stress that their definition of these is limited; they can say nothing about whether there is general movement toward variety in production, i.e., an expansion of product lines generally.

It appears that industrial districts are a viable development path in some, but not all, places, with earnest small firm districts accounting for some unspecified fraction of all districts. Predictably, a further dichotomy has been framed between (what Storper, 1997, calls) regionally "articulated" and "disarticulated" places. That is, places have been cast in terms of whether they have localized industrial advantages that enable concentrations of high-end industry on one hand, and on the other, those that rely for their sustenance upon non-local technology, investment, and know-how. This is serviceable enough, so long as it is kept in mind that the difference is descriptive, not explanatory. Even as a descriptive tool, however, it seems unlikely that things are so black and white. General urban economies may underpin and foster district formation, a

point that is not lost on proponents of this view, but not formalized by them either.<sup>27</sup>

Even outside the realm of urban effects, the dichotomous conception varnishes over processes of agglomeration that might describe, for instance, how specialized wine and orchard areas, established on the basis of ground advantages, develop regional advantages from exogenous economies and collective efficiency. More continuous effects are both more logical and likely. The more fruitful line of research about small firms and peripheral areas asks what types of firms *are* agglomerating, why, and to what effect. That literature is discussed below.

Another productive, if inextricably theoretical, line of critique in the neo-agglomeration debate relates to the systems of economic regulation that shape whether a pattern of industrial organization can be sustained and reproduced over time. It has been noted that the basic argument of the flexible specialization school is essentially regulationist. From Piore and Sabel's (1984) work came the insight that the regulatory structure undergirding the Fordist mode of production was in crisis. The regulation approach developed into a central critique of the very thesis that district forms were ascendant. Key to this critique is that flexible specialization's theoretical reliance on institutionalization and its empirical grounding in highly regulated environments appear to be at odds with the withdrawal from active market regulation by the public sector. Regulation theorists have argued that, even if Fordist regulation is waning, *it remains to be shown that resurgent regionalism represents a tenable alternative*. The regulation of

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<sup>27</sup> The omission of urban economics from district theory is particularly glaring among submissions from the California school, which is otherwise marked by theoretical rigor.

industrial districts has been elaborated along two somewhat contradictory lines, which argue that districts are: (a) self destructive and *cannot* be a stable alternative to the prior regulatory system; and (b) exploitive and *should not* be advanced as a desirable development alternative (Gertler 1988; Tickell and Peck 1992; Digiovanna 1996; Gough 1996).

The recession of 1989 to 1994 turned attention to the idea that industrial districts are prone to market failure (Harrison 1994; Saxenian 1994). In turn, promoters of the neo-agglomeration thesis have focused more on policy and options for active intervention. Scott (1995), for instance lists a menu of possibilities for institutional investments, including (1) technology transfer, (2) training, (3) basic management, (4) alliance building, and (5) public planning and infrastructure. While Scott's statement on this topic is typically elegant, it seems merely to restate for a metropolitan audience previous recommendations to state and small community leaders that were direct progeny of flexible specialization thinking (Sommers, Fossum et al. 1989; Cortright 1990; Rosenfeld, Shapira et al. 1992; Rosenfeld and Bosworth 1993).

In summary, while many elements of the flexible specialization thesis have been challenged, key contributions to general theory have been borne out. The flexible specialization school has tended to concentrate on the potential of district development in rural and "semiperipheral" areas and attempt to elucidate the contingent spatial processes that converge in the successful creation of new competitive advantages (Benton, 1990; Crevoisier, 1993). There is, however, something unavoidably squishy about the theory.



In an effort to impose greater rigor in the thinking, the California school turned to transaction cost theory as a basis for understanding district formation and function.

### **The California School and the Transactional Logic of Districts**

The second major theoretical contribution articulated the spatial logic of inter-firm divisions of labor and did so particularly in the context of high technology (Scott and Storper 1987) and other innovation-based (Storper and Christopherson 1987) industries. Often referred to as "the California school," this body of research examines district formation in a rather laissez-faire economic setting, and perhaps as a consequence, early formulations ignore collaborative efficiencies emphasized by the flexible specialization school. Key to understanding district formation, they maintained, was the logic of transactional economics.

Though seeds of this body of work emerged in parallel with Piore and Sabel's work, *The Second Industrial Divide* (1984), Scott and Storper's (1987) seminal formulations take it as a launching point. The California school and the debate around it has appropriated and elaborated many tenets of flexible specialization theory. A main distinction between these schools is that flexible specialization focuses on small firm districts, while the California school features districts that exist within complexes that are more extensive, technologically rooted, and metropolitan.

The approach begins by stripping from agglomeration theory most assumptions about localization economies, and working from the premise that districts arise from the economics of inter-firm linkages, i.e., divisions of labor. (Technical divisions of labor refer to task specialization and simply imply labor differentiation. *Social* divisions of

labor denote task specialization *between firms*.) Since the impulse of the firm is to maximize internal economies and minimize internal diseconomies, a key question concerns the conditions in which the bias toward internal organization gives way to social divisions of labor and external economies, and moreover, the conditions in which externalization becomes localized.

Scott and Storper's statement about the transaction theory of district formation (1987) begins with market expansion and the emergence of industrial economies, then elaborates the conditions of externalization and formative agglomeration. Finally (and least specifically) they describe the ripening of agglomeration economies into diseconomies, and other conditions in which new specialties may break away and form new industrial districts. Since the detail of this, which they called a "theoretical reconstruction," has been a key point of departure for many subsequent debates, the outline of their (1987) argument is expanded upon in the following paragraphs.

As the *extent of the market increases*, potential heightens for achieving industrial economies either internally or externally, in the form of a production complex. Vertical integration, or internalization of technical divisions of labor, occurs when internal economies are such that the technical division of labor, even when very elaborate, lends itself to inclusion under one management hierarchy.

There are many reasons for *vertical disintegration* and the emergence of social divisions of labor. Whenever production processes resist integration into an internalized system, it is possible to externalize them. If markets are unpredictable or unstable, producers may contract out work to avoid uncertainty, that is, to externalize risk.

Producers may need goods that can be produced more efficiently by firms with specialized management or knowledge of the task. Or, goods may have a minimal scale of economic production, which may not be obtained by serving the internal market alone. Whatever the reasons for vertical disintegration, it tends to create external economies in the form of declining costs resulting from the specialization of firms.

The theory describes the emergence of industrial complexes that may or may not be local. For localization, transaction costs are key. The replacement of hierarchical management (i.e., within the firm) with complex organization necessitates a structure of inter-firm *transactional relationships*, which often have geographically dependent cost structures. For instance, unstandardized products or uncertain transactions require perpetual bargaining, meaning that the fixed costs of negotiation are recurrent. Second, small, specialized transactions cannot command economies in scale or transportation. Third, transactions that are strategically problematic require relationships to be re-worked often and at unpredictable times. The greater the extent and magnitude of these costs, the greater the tendency to agglomerate. Industrial agglomerations are the geographical means through which producers realize the external economies of scale that are possible with the elaboration of the social division of labor.

Given a transactional basis for the industrial district, other agglomeration economies may develop. Among them, Scott and Storper single out labor markets to illustrate the more passive mechanisms of agglomeration and also to point out their limits. This amounts to a recapitulation of Weber's (1929) thinking. Industrial production complexes draw into their spatial orbit a labor force, which not only affords lower search

costs, but also generates benefits in the form of labor "habituation," and institutions that support skill production. But these same features may also provide a medium of political response via labor organization, which introduces local external diseconomies. Similarly, for land values and kindred pecuniary diseconomies, mounting costs within established centers reinforce a countervailing process of decentralization.

Hence, from centripetal forces of agglomeration, centrifugal ones of dispersion develop. It is in the nature of agglomeration economies that competitive advantages accrue to the place, not the firm. In order to free themselves from dependence on the local economy, the firm must recapture advantage, internalize it. Two paths of decentralization are illustrated. First, firms may "streamline external transactional relations" (i.e., re-internalize production), and de-skill labor processes, as means of reclaiming economies within the hierarchy of the firm. The form of decentralization, in this case, entails the spatial articulation of production along product cycle lines, with agglomerated activities limited to innovation and early production and the use of more diffuse, lower cost locations for routine production.

The other path entails the shift away from one center and a process of coalescence and emergence of new ones. "Windows of locational opportunity" for the formation of new industrial spaces arise "at those points in time when a shift from one dominant (industrial) ensemble to another is in progress" (p. 228). Scott and Storper suggest that shift and emergence of new production agglomerations is (a) a matter of labor politics, (b) enabled by dramatic change in the means and products of production, (c) is driven by

transactional strategy at the firm level, and (d) located in smaller cities and urban fringes, where employment politics are created anew.

Notwithstanding its stated focus on technology complexes, Scott and Storper's rather detailed theoretical specification of district formation has become a paradigmatic point of departure for theoretical debate and refinement. A number of challenges to the theory are notable here. First, Scott and Storper suggest that districts are, by necessity, transactionally instigated and driven. The resulting definition of a district in terms of local contracting is untenably narrow (Gertler 1992). Dense exchange relationships are neither universal nor necessary to account for industry clustering, particularly in cases of craft production. Other agglomeration factors may be prior and primary; this point has been acknowledged (Storper 1997).

Second, the theory provides a vision of agglomeration with roles for two types of institutions only, hierarchy and market. This represented, at the time, a blunt omission of the collective institutions that had been propounded in prior statements of flexible specialization. In this matter, especially, the California school stood at odds with the focus in flexible specialization on the collective and institutional aspects of districts (and, consequently, their orientation to policy). That now seems a crucial omission. It has since been shown, and accepted among proponents of the neo-agglomeration thesis, that agglomerations that lack norms and institutions of coordination are prone to market failure (Harrison 1992; Saxenian 1994). Scott (1995) concedes, first, that transaction theory (Coase 1937) makes room for cooperative and para-market institutions and suggests that they may be crucial to the durability of districts through rounds of market

and technology change; and second, that this view is consistent with the empirical evidence. Storper (1995) has, as earlier noted, expanded on this issue to propose the region as a key seat of untraded interdependencies.

Third, Gertler (1992) has pointed out the tendency for this thinking to present changes in production technology and relations as somehow prior and independent drivers of spatial change, as if industrial economies take shape first "only to later reveal their 'spatial implications'. If the study of agglomerated flexible specialization is to shed any clearer light on spatial processes of growth and decline, then *the character of places (and human agents therein) will have to be considered not only as effect but also as cause*, and technological change must be understood as developing from its spatial context" (271, italics mine). This critique has driven the reconceptualization of regional complexes as evolutionary and dynamic learning regions. This amounts to an integration into this thinking of concepts propounded under the rubric of *innovative milieu* (Camagni 1988; Crevoisier and Maillat 1988; Crevoisier 1993).

Fourth, concern has been raised that the theory at once ignores and relies upon general urban economies as underpinnings of agglomeration effects.<sup>28</sup> Phelps (1992), for instance, argues that in the absence of general external economies, the case of the motion picture industry that Storper has leaned heavily upon (1987; 1997) may reduce to little more than cumulative causation; the particular path that localized industry has taken may be interesting, but it offers little insight into general industrial processes. Harrison and

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<sup>28</sup> Scott and Storper's 1987 theorization does concede, in passing, that the whole effect is underpinned by general urbanization economies, seen in the massing of a workforce and present economies of ancillary

others' (1996) analysis suggests that general urban effects contribute more explanatory power than do industry specific effects.

Finally, as has been noted, the early theory from the California school minimized the role in contemporary development of global hierarchical reintegration, that is, corporate globalization (Harrison 1994). Storper's recent effort, *Regional World* (1997) is undoubtedly the most complete recent accounting and synthesis of this discourse. Storper identifies the emergence of lean management regimes based on de-localization as well as an exit model of territorial behavior as a prominent (if not dominant) path in large scale industry. Storper concedes that locational exit and hierarchical integration is common, but suggests that such forms can not (and should not) be sustained as a mode of accumulation. The form may be more a product of mimetic norm (i.e., managers as copy-cats) than it is stable and rational behavior.

Although hierarchically integrated forms of industrial organization do not concern the present study cases directly, this thinking does have secondary (industrial) and tertiary (market) implications for my broader thesis. Primary industrial intensification and exit has been the norm in rural development for well over a century. It seems likely that the rise of "lean" strategies entailing industrial exit may reduce the relative advantage of cities newly exposed to such a diet. This may have the subsidiary effect of driving market increase and strengthening the net attraction of peripheral areas (Beale 1997). The contagion to urban industries of global integration and local exit seems likely to shift

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providers of goods and services.

the point of demographic equilibrium further toward rural areas, precisely as laid out in migration theory (Wardwell 1980).

A final major aspect of the agglomeration debate must be noted. Both flexible specialization and the California school have supposed that regionalization and district formation may be driven by broad *motive forces*. In flexible specialization the basis for a motive force is the disintegration and globalization of *markets* coupled with regulatory crisis. A profusion of niches that can be served by specialist centers makes district development possible. Such centers are theorized to coalesce where regulatory systems become rationalized to a certain district form or market specialty. According to this view, population diffusion in the western United States might be read in terms of market growth and divisions of labor at the high end. That is, diffusion of agglomeration effects to smaller places might be attributed to market proliferation directly, with districts occurring in places with amenable institutional and industrial systems (i.e., milieu).

The California school emphasizes *technology* as the leading force of a new regulatory-industrial system. By this view, the main motive for a resurgence of regionalism is a *techno-economic paradigm* (Storper and Walker 1989). Specifically, micro-processing and information technologies affect innovation and growth in so broad a range of sectors as to constitute a system-wide economic shift, led by high technology, producer services, and craft industries (Pollard and Storper 1996). District formation in smaller places may be thought to be (a) mediated by technology and telecommunications, and (b) expressed through the urban industrial flight and subsequent agglomeration, *or* (c) in more diffuse and hierarchical industrial forms. This account of motive forces



speaks strongly to production in high value, low bulk products in global markets. The problem is, those goods whose markets are constrained by transportation effects are left in a gray area. This view fails to articulate the influence of transportation cost and position of bulky goods in the paradigm. We can suggest that the technological conception of motives would treat high bulk cases as reliant on telecommunications to facilitate customization of products and penetration of distant markets.

Others have proposed a third main motive: *labor*. This view contends that industrial districts characterized by flexibility and specialization rest on the fluid exploitation of workers within local regimes that enable low wages, labor informalization, and lax regulation of work and environmental conditions. In essence, cheap and flexible labor subsidizes the competitive advantage of new regional agglomerations. It is important to note that the scope of this argument is by no means limited to labor exploitation (Massey 1995). Amin and Thrift (1992), for instance, describe Marshallian centers of technological innovation and learning in the context of their interpretation of global industrial hierarchies. The exploitation of cheap labor, they claim, is particularly descriptive of relatively rural districts, making districts a mixed blessing as a development option. The problem, as I have noted before, is that most casework has focused on industries that have settled in rural places for product cycle reasons. (See, for instance: Glasmeier 1991; Conroy and Glasmeier 1992; Simmons and Kalantardis 1994). It remains to be seen whether labor factors are definitive in cases where the industries in question are indigenous to the rural economy.

### **Small Firms in Rural Districts: Beyond the European Canon**

The hearth of research in flexible specialization is "the third Italy," Baden-Württemberg, Germany; and Jutland, Denmark. Inspirational though these classic cases may be, they do not embody the essential truth of all industrial districts. Things look different in districts that are larger, more hierarchically organized, more metropolitan, and more technologically rooted. This compelled attention to southern California and older industrial regions of the United States. The problem is precisely analogous within the small firm variant: the classical model of neo-Marshallian districts must be tailored to fit circumstances where districts are smaller, more nascent, in less industrially developed space, and with greater technological simplicity.

In the following paragraphs, I outline the research into the non-canonical small-firm districts. Much of this literature has been referred to above, but it remains to be described as a coherent, if partial, body of work. By their location and development, these cases sit on the far frontiers of district theory and extend its boundaries.

Rural agglomerations are not an oxymoronic fiction; to the contrary, industry clusters are evident within the context of rather dispersed settlement. The study of such industrial clusters is fruitful for several reasons. Among them, studies of rural agglomerations can help tease apart industrialization and urbanization dynamics that have been conflated in studies of more mature and urbanized districts. Examining small-firm districts outside the European core also helps to extend thinking beyond the poles of the sanguine and the pessimistic; away from conceptual purity and toward more pragmatic notions of the role of Marshallian districts in the contemporary industrial economy.

Finally, small firm districts have become a key area of interest within economic development policy and practice, particularly in the field of rural development. Scholarship concerning what works, where, and why has lagged behind the demand for policy-relevant answers.

A stream of studies of the European periphery (Crevoisier and Maillat 1988; Benton 1990; Hansen 1990; Simmons and Kalantardis 1994; Malmberg 1996) and in developing countries (Knudsen 1994; Pedersen, Sverrisson et al. 1994; Sverrisson 1994; van Dijk 1994) has concentrated on flexible specialization among small firms in peripheral places. The work reflects rich traditions of thought on unbalanced development. Particularly influential has been the research efforts of Hubert Schmitz, who set out an ambitious research agenda (Schmitz 1990; Rasmussen, Schmitz et al. 1992), orchestrated an array of district case studies in developing countries (Schmitz 1992; Knudsen 1994), and synthesized findings in both conceptual (Schmitz 1995) and policy (Schmitz and Musyck 1994; Humphrey and Schmitz 1996) terms. Together, these research projects attempt to elucidate the social, economic, cultural, and policy factors that make the whole of an industrial cluster's productive capacity greater than the sum of its parts.

Much of this research on small firm districts takes the industry cluster – the simple concentration of like producers in space – as the starting point for research into district dynamics. A key proposition that sharpens the focus on the role of clusters, particularly for relatively rural or semi-peripheral areas, is that clusters help firms within them to better adapt to disruptive circumstances (Schmitz 1990). Clustering makes

possible efficiency gains which individual small producers can rarely attain. The proposition is a fruitful one for research, because it frames the (sometimes overly broad) discussions of global industrial crisis in terms of specific shocks and responses as they occur in the context of district development.

Where clusters exist, collective advantage does not necessarily follow. District effects may either be nascent and unobservable, or the industrial milieu may not be conducive to development of agglomeration economies. The same problem that besets small scale industry studies in general holds for small-firm clusters. Generalizations about whether small firm clusters have growth and employment potential are untenable, because *growth prospects are the outcome not only of pressures and constraints, but also of opportunities and initiatives*. It is important is to understand the conditions in which growth occurs (Schmitz 1995).

Longhi and Quere (1993) concentrate on two qualities of the local milieu: (a) the generation of a concentration of exchanges, collaborations, and (local external) efficiencies; and (b) the emergence of local labor markets that foster training and movement of skilled production workers between firms. They suggest that skilled workers become a means through which firms transmit information, build productive relationships, and enhance their capacity for innovation. This literature considers transactional relations as part of the picture, but contracting is not privileged as it is in the California school. Prominent among non-transactional agglomeration economies is the massing of a labor force. Schmitz, for instance, asks whether low-wage conditions for skilled workers inhibit competition on the basis of innovation (1990). It appears that, in

the context of developing countries, the district form conforms to neither sanguine nor pessimistic visions of flexible specialization (Schmitz 1995). As in the California literature, a bifurcated labor force, with a large cadre of unskilled (even brazenly used) workers is not inconsistent with the presence of innovative technical and managerial core. Nothing in the nature of a small-firm industrial district, it appears, makes it immune to labor abuse, but by the same token, nothing about one necessitates worker subversion. It is a finding that rebuffs the critical stream's focus on the use of low cost, flexible labor as a defining advantage of districts.

The domestic literature focusing on agglomeration in the periphery is far less robust than has the international literature just discussed. While domestic research is ongoing, it does not approach the coherent stream of scholarship in described in the European small-firm literature. Rosenfeld (1990; 1992; 1992; 1993; 1993; 1996) is surely the most consistent and forceful domestic analyst to have engaged industrial districts specifically as targets and tactics of rural development. Recently, Rosenfeld (1997) specified that industry clusters precede the development of districts. His analysis proceeds to discern the features of district development on a path from nominal to functional agglomeration.

Rosenfeld follows a legacy of policy-oriented readings of scholarly texts on industrial districts in the European periphery (see: Friedman 1989; Hatch 1991). Others in this mold have emerged regionally (for Northwest examples, see Sommers, Fossum et al. 1989; Cortright 1990; Fossum 1993; Sommers, 1998). Within this literature, industrial districts are presented as organizing paradigms for economic development at

the local, state, and national levels. In essence, manufacturing networks develop local production chains (contracting and joint projects) and foment institutions and service channels targeting groups of regionally clustered firms. The micro-focus of domestic "flexible manufacturing network" initiatives in the United States contrast with the national policy orientation of (Amin and Robins 1991; Gough 1996; Gough 1996; Morgan 1997), but are parallel to others, notably in the innovative milieu stream (Camagni 1988; Hansen 1990; Crevoisier 1993; Malmberg 1996).

An earlier research approach with comparable implications for localized industrial development (and particularly industry parks) is, I think, aptly dismissed (Scott and Storper 1987; Ettlinger 1997) as ad hoc and poorly underpinned by theory. The method in this line of work is to empirically adduce the locational attributes of "successful" new centers, then consider these attributes as preconditions for localized industrial (and especially high technology) development (Office of Technology Assessment 1984; Hall and Markusen 1985). While intriguing, the correlates of success resulting from such methods appear invalid, unreliable, and not very useful. Rosenfeld and his associates have far surpassed this work, if only by importing key premises of the district literature to yield a more inductive approach to understanding the levers of regional development (Rosenfeld, Shapira et al. 1992; Rosenfeld 1996; Rosenfeld 1997).

As Harrison has pointed out (1994, pp. 242-244), however, activism fostered by this brand of applied scholarship has tended to race ahead of more formal and critical scholarship on the topic. Amin and others point out that district formation is propounded as a solution far more broadly and optimistically than the evidence permits, and that this

amounts to leading people astray (Amin and Robbins 1990; Amin and Robins 1991).

While criticism on macro grounds is well placed, the nuance of Rosenfeld's tactics and their distinctiveness from industry-park strategies that came before should not be underestimated. The key point is that this body of work is oriented almost exclusively to applied policy development and network building strategies. Lacking is parallel progress describing the place, pace, and role of agglomeration as a organic driver of development in the domestic periphery.

Partial progress to describing the nature of rural districts has been supplied in research led by Edward Malecki and Amy Glasmeier. Malecki and Tootle have, for instance, pursued a project that compares firms within local business networks to more isolated ones in terms of trade relations, information strategies, and community institutions (1994a; 1994b; 1997). By setting their research efforts outside the realm of a few cities and industries, Malecki and Tootle have done us the service of offering generalizations across diverse types of networks. Malecki and Tootle conclude, for instance, that the development of local networks must be considered in the context of their local settings, with attention to local sources of financial support and institutions among the relations of interest (1994b). As Schmitz (1995) has noted, research focused on certain industries and place types has enabled recent work to speak more usefully to development paths, but has done so at a cost of advancing general principles. Malecki's work has sidestepped the limitations of narrow case selection.

Just as clustering does not ensure the presence of collective efficiencies, clustering is not indispensable to the competitive success of even small firms. Malecki's

research into manufacturers in north Florida finds few clusters to examine, and many cases in which small niche manufacturers successfully get the information and technology they need to prosper in relative isolation ( see also Cornish 1997; Malecki 1997). He concludes that the crucial divide is in the personality of the firm, and differentiates between "extroverts" and "introverts," that is, those whose external information gathering capabilities are more or less intense. The presence of like others can raise the overall intelligence gathering capacity of the cluster, but this does not mean it is essential to individual firms.

Glasmeier's work has focused more on sectoral analyses of rural prospects (Glasmeier 1986; Glasmeier 1991; Glasmeier 1994; Glasmeier and Howland 1995), and the effects on regional specialties of macro-regulatory shifts (1992; 1993). Glasmeier tends to confirm the gross trend of reorientation of routine rural manufacturing toward the international periphery, particularly in the southern and eastern states. Her work issues useful warnings and caveats about sanguine contemplation of stable and widespread industrial centers in rural America. Also notable in this vein is the work of Niles Hansen, who has brought an urban planning approach to the study of districts in Northern Europe (1990; 1991; 1992; 1996). (Hansen's work has generally been reported under the rubric of the flexible specialization literature.)

### ***Research questions and challenges of small firm clusters***

The review in this chapter has set forth pieces of the puzzle in sufficient detail to identify possibilities for clusters and districts in rural America. My aim in this section is twofold: (1) to propose questions and alternative concepts that are to be addressed in the



case studies, which will constitute a template for the presentation of findings in chapters 4 and 5; and (2) to introduce challenges of method and measurement in small firm districts, as a prelude to the methodological discussion chapter three.

### **Theorization and research questions**

The present study speaks neither to the *extent* of districts as a contemporary driver of development in the rural Northwest, nor to the *balance* of forces that are driving agglomerations in the regional economy as a whole. The present study does, however, examine how agglomeration effects work in the particular context of these cases. The aim of this section is to theorize district creation and development in the contemporary rural Northwest. The first set of questions I address concerns basic identification of clusters and their broad significance. The second set of questions seeks to describe the period from early cluster formation through district nascence, to the identification of cluster attributes that are consistent with current thinking about districts. The third set of questions explores in greater detail the particular mechanisms through which agglomeration economies are thought to develop, running from conditions of exchange and transaction to more general, exogenous features of the industrial setting. The primary thrust of the study is to determine which of the interpretations of district phenomena reviewed above best describe the development processes observed in the case studies.

### **Description of clusters**

By definition, a cluster consists of kindred, co-located firms. In order to describe the local industry, within the context of the broader industry, it is necessary to *specify the*

*range of industrial specialties and the territory that constitutes the case at hand. In addition, elements of the broader input-output system that are non-local must be identified.*

*What is the district's size, and how has it performed in relation to the industry as a whole?* A fundamental presumption about clusters as districts is that they confer advantages that propel growth and innovation over and above the performance of the industry as a whole. Therefore, in addition to noting numbers and size distribution of firms, it is essential to consider data that speaks to their growth performance. This approach to gauging the significance of clusters in an industrial context is closely related to earlier thinking about growth poles. While industrial districts *may* be leading a shift in the techno-economic paradigm, districts certainly constitute seats of regional advantage. Rapid growth at the level of the cluster may be taken as a rough signal that it is functioning as a district.

### **District nascence and formation**

The reason for studying districts in relatively rural, forest economies of the contemporary Northwest is because of the need, for both basic and applied purposes, to develop a better description of the period between the absence of a cluster and district nascence. These cases were selected, in part, because they emerged in the last twenty-five years, facilitating an examination of contemporary conditions of district formation.

I propose that three processes are distinguishable along the path to district formation: location, externalization, and agglomeration. One task is to *describe the relative importance of factors at moments of location, particularly when the cluster is in*

*emergence*. Location is expressed in the moment of firm formation in place. Classical location theory accounts for the initial presence of one firm, or a few similar firms. In the particular case of wood products, we may expect to find explanatory value in the ready access to timber and other material factors. More generally, district studies tend to reinforce the proposition that cities matter. Scott and Storper (1987), for instance, suggest favorable conditions in second and third tier cities, or the peripheral realm of larger metropolises. Schmitz (1995) reports similar findings among districts in less developed countries: while most districts are observed in larger cities, the more dynamic and growing ones are in the orbit of smaller cities.

Urban proximity may accelerate processes of district formation by conferring three types of market advantages: a pool of laborers, a mass of consumers, and a web of ancillary suppliers and intermediate purchasers. Curiously, the recent district literature has focused on only two of these advantages: labor (Scott 1990) and input-output proximity (Glasmeier 1990; Gertler 1995; Cornish 1997). Virtually ignored has been the role of cities as markets for final consumption, which is, in any event, a time honored factor in location studies. (It is worth noting that these three factors of urban advantage correspond to the three main theses about motive force: labor exploitation, technological shift, and market fragmentation.)

The second task of analyzing cluster formation is to *describe the nature of general externalization effects as they pertain to growth and proliferation of firms within the cluster*. While location is defined as a point-in-time appraisal of value, urban and industrial settings may also be described as flows, or processes. Externalization focuses

on change dynamics and speaks directly to the need to account for differences in growth and decline at various geographic scales. Externalization is defined as economies arising from broader technological or market changes that favor the general development of an industry. Growth effects from externalization are not necessarily limited to clusters. We are, however, concerned with instances where external economies give rise to localization.

The third task in describing district formation is to *specify the attributes of agglomeration economies evident in the cluster*. District theory has suggested that, while classical location factors may account for the initial presence and growth of a cluster, agglomeration economies become progressively more important in accounting for firm location and behavior. Agglomeration economies refer specifically to development dynamics that are internal to the district itself. This definition embodies two main types of agglomeration effects: exogenous and collective. Exogenous economies refer to features of the cluster whose emergence benefits all firms within the district. Examples include labor organization and a pool of skilled workers; certain matters of infrastructure, such as transportation, communication, and educational institutions; the emergence of subsidiary trades; and industrial atmosphere, which includes norms, skills, knowledge, and information advantages that take on the character of public goods. The second type of agglomeration economies encompasses collective efficiencies, which are marked by joint action or the sharing of fixed costs in the form of social divisions of labor, cooperation, alliance, and institutions.

Case description should identify agglomeration economies in the context of their emergence, i.e., the basic enumeration of features of the cluster that are coherent with its reading as a district. *Is skilled labor scarce or plentiful? How do wages compare with the regional industry generally? What features of infrastructure (i.e., transportation, communication, education) benefit the cluster? Is the development of subsidiary trades and services evident? Is competition between horizontal competitors "fierce" or "friendly," or more particularly, in what matters is competition atomistic and in what matters amicable? What sectoral associations, training, and kindred institutions exist? Have social divisions of labor developed? Are workers and equipment exchanged? To what extent, and in what forums, is information exchanged about markets and technology? Are formal alliances, joint ventures, or partnerships evident? If institutions exist, what is their origin and function?*

The historical and descriptive overviews of the cases, permits more detailed questions about how districts develop.

### **Collective and transactional mechanisms of district development**

The main theme of this section is to examine the mechanisms through which new capacity develops within clusters. A major cleavage in theorization of district phenomena is exemplified in key assumptions of flexible specialization and the literature of the California school. The California school stripped agglomeration theory of assumptions about general agglomeration effects and advanced transactions between firms as prior and primary in district development. The alternative view holds that cluster development is an interactive process that is shaped by a variety of institutional

routines and social conventions (Morgan 1997). One problem with this perspective is that the logic of the interactive model is circular to its core. A transactional basis for inter-firm linkages may be prior but not primary, that is, contracting may arise first, but be motivated by exogenous norms and motivations distinct from market mechanisms of the sort described by Scott and Storper. It remains to be seen whether we can tease apart transactional from other agglomeration effects. Some useful comparisons can, however, be made that will inform the mechanisms of district development. The first set of questions for exploration, then, focus on the gray area between transactions and their exogenous attributes.

*How does enhanced competitive capacity by one firm benefit others in the cluster?* I define development of competitive capacity as the addition of processes, products, or markets. This may occur through a process of diffusion of innovation, which is treated in district theory under the rubric of exogenous economies (e.g., of information) (Cornish 1997; Malecki 1997). Alternatively, the medium of externalization may be transactional, with additional capacity of one firm increasing the production scope of others via contracting. Horizontal relations marked by head-to-head competition may be verticalized through the uneven development of competitive capacity (Schmitz 1995). In this manner competition within the cluster tends toward specialization and differentiation of firms. Such processes have been observed in small furniture districts elsewhere (Sverrisson 1994). Questions under this rubric include: *Do certain firms play a lead role in developing distant markets, products and processes? Is a cadre of very small and informal firms (i.e., home-workers) used to complete certain steps of production or*

*service delivery? Are these leader-follower relationships marked by firm dominance and submission, or are they better described by collaboration and partnership?*

*How do negative external economies affect cluster development?* A more general approach to exploring the mechanisms of district development is to seek insights from periods of crisis. Common in descriptions of district development is the notion that conditions of crisis and instability propel adaptation, limit the possibilities for internalization of economies, and foster district development. As Schmitz put it, "The relevance of clustering is brought into focus most sharply by case studies which show the success of local producers in breaking into export markets and/or coping with domestic crisis" (Schmitz 1990). This follows Shumpeter's idea of creative destruction, in suggesting that key aspects of developing advantage may be observed in the context of conditions unfavorable to growth. This may, again, be measured in terms of product, process, and market development in response to crisis. The present study is not comparative, but it can address an underlying expectation. *Do clusters grow in conditions of positive external economies and develop in negative conditions?*

*What accounts for the emergence of specialized input-output functions?*

Mechanisms of cluster development may also be viewed in the process of vertical thickening of the clusters. One theory suggests that the development of ancillary goods and services providers is driven by local transactional relationships, a view of districts as production chains. Intermediate goods and services producers emerge because of demand generated within the clusters themselves (Glasmeier 1990). Another alternative, which is inclusive of the first, is that clusters attract ancillary producers because they

function as market centers for buyers, not just local buyers. A third alternative, still broader, is that specialized functions emerge for the same reasons core functions proliferate, because of a thoroughgoing location advantage for the specialized industry, a possibility that extends to the general attributes of the exogenous economy, including labor, infrastructure, institutions, *and* markets.

*How do new firms arise?* Essential to district development is that, by whatever means, kindred and complementary firms proliferate, accelerating district development via scale effects. Here, we step away from the narrow conception of competitive capacity to consider what accounts for the growing girth of the cluster itself. The major alternative expectations are similar to those enumerated above: new firms are (a) spun off as transactionally linked firms, (b) attracted by more general market advantages, or (c) attracted by still more general location advantages. A fourth possibility is that firms proliferate because of an exodus of workers from “permanently failing” firms (Appold 1998). That refers to skilled workers who engage in firm start-ups, not on the expectation of contracts, but more simply because workers acquire valuable skills that are not used within the firm. This last factor implies that new firms arise on both horizontal and vertical axes as a product of firms being unable to keep up with the competitive capacity of their workers. *Can firm formation be traced to skilled craftspeople who “spun off” from other firms as competitors or specialists?*

The more common discussion of labor in districts concerns workers' contribution to exogenous economies. The massing of a skilled labor force is widely acknowledged as a source of local external advantage. What is less clear is in what sense labor markets



constitute a mechanism for the development of other advantages. Beyond their potential role as a stock of potential entrepreneurs, other questions bear exploration concerning the role played by skilled labor and competition for it. *Does the movement of skilled laborers constitute a means through which firms transmit information, build productive relationships, and enhance their capacity for innovation, as Longhi and Quere (1993) suggest? Do low-wage conditions for skilled workers inhibit competition on the basis of innovation, as Schmitz (1990) suggests?*

*Institutions: can districts be constructed?* A key proposition that compelled the flexible specialization thesis, was that districts could be induced as a matter of economic policy. The power of that contention was largely neutralized when its major underlying expectation – that structural crisis and market fragmentation would disadvantage the alternatives – proved false. Conditions of externalization, which are a condition of district formation, are far from universal. Complicating the situation is that recent research has made it abundantly clear that districts arise in diverse regulatory settings, ranging at the extremes from the high trust-based, highly governed environments described in the cases from the third Italy, to the cutthroat, free market atmosphere of some southern California districts (Tickell and Peck 1992). We must, then, devise thinking that is fluid about the particulars of the regulatory system, but sensitive to the idea that in the course of district development, some sort of micro-regulatory system, which includes formal and informal institutions, is established that enables the district to emerge, grow, and adapt. The complex research problem is to tease apart the influence of formal institutions from other aspects of the system.

It is now widely accepted that formal institutions contribute to exogenous economies and enhance agglomeration effects. Formal institutions, however, especially at the state and national levels, have been discounted as basic factors to district formation. Studies that have observed the role of policy in district formation conclude, in essence, that public institutions may improve the function of an established cluster, but are unlikely to induce agglomeration among unrelated firms (Schmitz and Musyck 1994; Scott 1995; Humphrey and Schmitz 1996).

The bulk of the institutional literature appears to have come into alignment with the French school, which holds that districts are neither coincidental nor induced, but the product of problem solving (technological learning) and know-how (production expertise) as those intersect in the local industrial setting in conditions of externalization. That interpretation views innovative milieu in the realm of informal institutions, and contends that what matters is the fluid process of problem solving among capable (but atomistic) players. Real estate promotion and evangelizing for collaborative practices, they suggest, are of little fundamental consequence (Longhi and Quere 1993).

Notwithstanding this caveat, it remains possible for small firm districts to be significantly shaped, if not created, through local institutions. Recall that it was Marshall who noted institutions in terms of collective economies, and described their function of spreading the cost of services and infrastructure among many firms, lowering entry barriers for *small* firms, and reducing their vulnerability (Oughton and Whittam 1997). This general observation persists in the current literature (Scott 1995; Humphrey and Schmitz 1996; Rosenfeld 1997). Moreover, a small literature on “community

entrepreneurs,” suggests that the promotion of norms and concrete investments from within *can* make a significant difference in the form and function of industry networks and clusters (Johannisson 1990; Malecki and Tootle 1994). *Have local public and quasi-public institutions created collective economies? Have community entrepreneurs played a discernible role?*

*Motive force.* A final question to be addressed here concerns *how macro-level drivers of district formation relate to these cases, and moreover, how recent population diffusion in the Northwest bear on the situation.* Population diffusion may be consistent with any of the three motives described above: market disintegration, technological and communications change, and labor exploitation. To be consistent with the first interpretation, district formation would be facilitated by regional growth via effective demand for specialized goods (Schmitz 1995). In the second, technologies (especially for communication) would evidently reduce the urban scale at which agglomeration effects may operate, and (more measurably) increase the distances over which industries compete (Storper 1995). In the last, rural clusters would appear to be a reflection of the general impulse to seek advantage in lax regulation and unorganized labor. This last view often anticipates that rural clusters will be marked by linkages to established industry centers and be characterized by a few, major purchasers (Amin and Thrift 1992), as in the case of the Greek garment districts (Simmons and Kalantardis 1994). The final research imperative will be to consider the fit of this triad of motive forces with the observed cases.

Answers to these questions should permit an assessment of the cases in relation to several alternative interpretations of district development that suggest contemporary districts may be characterized by:

1. transactional decisions of lead firms within the cluster, as in the classical conception of the large firm variant of flexible specialization (Scott 1990);
2. demand and decisions of an outside hierarchy, and marked by pecuniary advantages of rural areas, as in the global-hierarchy conception of districts as integrated nodes of larger systems (Amin and Thrift 1992);
3. social divisions of labor in the absence of dominant firms, characterized by evolution of horizontal competitors toward specialization, and the emergence of norms and institutions that facilitate collective efficiency, as in the small firm variant of flexible specialization (Schmitz 1992; Pedersen, Sverrisson et al. 1994);
4. know-how and institutionalized problem solving by autonomous professionals whose proximity is key for purposes of market and technological learning, as in the innovative milieu conception (Crevoisier 1996).

#### Research challenges in small firm clusters

A number of particular challenges confront researchers concerned with understanding agglomeration effects in rural space. It seems wise to touch on them briefly here, as they help rationalize the research focus outlined above and point us toward the methodology presented in the next chapter.

Among the key problems of examining rural districts is the practical difficulty in identifying them. Districts embody diverse industrial specialties, spanning multiple SIC

codes. Identifying the mix of specialties requires *a priori* knowledge about the type of cluster being sought, which is problematic for measuring the extent of clusters in rural economies. Moreover, data for many industrial specialties are often suppressed at more meaningful levels of spatial analysis. The result is that rural industrial clusters are often statistically invisible. It is a problem that makes comparative and macro-studies difficult to define with precision, and helps account for the reliance on case analysis.

Among the abiding problems of agglomeration studies is that of defining external economies in ways that are operationalized *a priori*. Take information advantages, for example. Efficient flows of information are hardly limited to districts, and in fact within them, the nature and pathways of information are diverse. This problem of operationalization has a stultifying effect finding accord between more systematic and macro studies and those more reliant on case study methods. The upshot is that case studies are privileged by advocates of the neo-agglomeration thesis (who know external economies when they see them), and macro studies more favored by its critics.

Analysis of rural industrial clusters is further complicated by the fact that they may be quite spread out relative to their total capacities. As Schmitz (1990), asks "how concentrated is concentrated?" Specialty agricultural areas and tourism corridors are two examples of industrial forms that almost certainly benefit from agglomeration effects, yet are by nature spatially expansive. As Scott has shown (Scott 1983a; Scott 1983b; Scott 1984), districts have their own core and periphery effects. The rural context of core and peripheral districts bears more articulation than can be provided within the present scope of study. If the present cases are spatially expansive, then the major focus

will be on their core effects. Further compounding these problems is that not all cases are not contained so well conceptually as the classical examples from the flexible specialization and California literatures. A "cluster" of furniture makers might, for instance, include some larger sawmills that have diversified new processing functions within their establishments, along with very small artisan firms. Such large and small firms may (or may not) interact in significant ways. Such clusters may be nascent districts, or be developing on divergent paths, and telling the difference is easy to ponder but difficult to operationalize. Not all clusters of like firms behave as industrial districts (1990).

### **Chapter 3: Research Methods**

This research presents a case study investigation of nascent districts in “timber country” of the non-metropolitan Northwest. The paucity of existing analyses of districts in American rural spaces, particularly in industries that are indigenous in rural economies, suggests the need for exploratory research to theorize district phenomena as they may play out in these conditions. In preliminary research, clusters of wood products firms were identified in the Northwest states. The two cases selected for this dissertation were selected because they had growth momentum, formed relatively recently, and reflected variety in products and locations within the region. As is common in district studies, both the cases and the informants were selected by non-probabilistic methods. Informants were selected both by snowball referrals and by sampling for representative variety of products and establishment sizes from locally identified lists of firms. Because many of the attributes of interest concern social relations among the firms that constitute the districts, the “case” in these cases are the districts themselves.

#### ***General research approach***

The business proprietors who were my main informants have situated expertise, meaning that they have intimate understanding of their own business, and working knowledge of the industry. I asked all informants (20 in the log home case, and 24 in the marine trades case) about their own operations, their relations with others, and about the area-industry. Asking proprietors to speak about the practices of their peers can be

problematic, but it appears to be reasonable. Firms interviewed represent a large proportion of all producers in their areas. Crosschecking among interviews enables judgments to be made about those aspects of informant reports that are more or less reliable. Comments that were contradictory from one informant to another were either clarified through follow-up questioning, or discarded.

Such methods are irreplaceable for understanding the logic of firm behavior, but are problematic as a means of understanding the general parameters of the industry. I took on faith informant statements about the specific events in the growth and change of the local industries and the behavior of other firms, unless they were contradicted by (1) other informants, or (2) other basic sources. These other sources included federal census and County Business Patterns publications, as well as industry research reports. Except in the broadest terms, I avoid representing information from the interviews about the economic size and impact of the industries. Methods using random sampling can better address those questions. I believe the information gathered provides a sound basis for interpreting how these clusters emerged, the nature of collective efficiency in them, and the broader forces that shaped their development.

The emergence of a dominantly qualitative approach to the research was among the unexpected turns in this project. The original research design proposed to survey firms within six clusters of wood products firms in the Northwest region along the urban-rural spectrum (Fossum 1995). Along the way, several things favored a more qualitative approach to analysis and reporting.



In the course of the preliminary research, I discovered that the diverse roles and relationships of firms within the clusters tended to complicate the problem of quantitative data design. Mapping the players and their situations in the local complex was a significant task in its own right. Information about joint action proved slippery; and preliminary interviews suggested that the reality of how these proprietors interact would be lost in efforts to operationalize it. The number of firms in each case was rather small, decreasing the potential power of statistical analysis, and increasing advantages of deep understanding of the cases.

Moreover, in the course of the field work, I found the key informants more willing than I expected to participate in an intensive interview process. The great majority of interview solicitations were accepted. The informants seemed forthright about their operations, markets, history, and relations, and they were very generous with their time. In scheduling the interviews with key firms, most informants initially specified a limited time (30 to 60 minutes), but they nearly always agreed to extend the interview.

As the research proceeded, the key informant interviews grew longer and the interview questions evolved to reflect my growing understanding of the cases, particularly as regards inter-firm relations and the historical development of the clusters. I sought interviews with firms that came up repeatedly in this process, and these tended to be somewhat more focused on formation, contracting, or diversification of the clusters. Sources like these tended to refine and extend my understanding of the situation in ways that went beyond the original research design. I also added to the methodology a series

of brief interviews for which the informants were selected opportunistically, which aimed to validate and extend information from the main interviews.

I have earlier noted Schmitz's (1990) observation that rural clusters may be less clustered, i.e., more spatially diffuse. The log home case provided a good example for study. Here, the concentrated core of log home producers is spread over a twenty-mile area in the Bitterroot Valley. The relatively narrow range of activities that constitute log home production enabled me to interview firms outside of the Bitterroot Valley with some confidence that distance mattered to the differences observed. This case presented a research opportunity to explore the reach of district effects by extending the interviews to firms outside this core area.

The same ready opportunity for control was less available in the marine trades case. The number of diverse marine trades and the wide variations in niches of boat building firms made understanding the cluster enough of a challenge. I did interview one firm outside of the cluster, a larger manufacturer that had relocated outside of the Port Townsend area in the course of the research. Chasing this establishment helped in addressing questions about the development and maturation of the district.

### ***The cases and informants***

In the preliminary research (Braden, Fossum et al. 1997), a team of industry analysts constructed a database of Northwest secondary wood products firms by county and SIC codes. This was used to identify clusters of similarly specialized firms. The project identified numerous concentrations of like secondary wood products firms. That

analysis informed the selection of cases for detailed analysis both in the previous paper and the present dissertation.

The two cases studied in this dissertation were selected because they appeared (1) to have growth momentum as area-industries, (2) to occupy distinctly different places and industries in the nonmetropolitan Northwest, and (3) to have come about quite recently, in the early 1970s. In other words, these cases were apparent districts whose situational differences promised to reflect some of the range of differences in the population of such districts, and were new enough that the people that were involved in it could report the development of the area industries.

The interview protocol, Appendix 1, was designed to operationalize the research questions presented in the preceding chapter. Twenty interviews were conducted in the log home case; the informants are listed in Appendix 2. Twenty-four interviews were conducted in the marine trades case; the informants for this case are listed in Appendix 3. All interviews were semi-structured. Interviews were conducted with informants with a significant history in the area, especially, included discussion that drew out information about the events, products, and relations.

Preliminary interviews were conducted with analysts and local leaders familiar with the area-industries, and existing publications about the clusters were gathered. Because understanding cluster emergence was an important research objective, in the initial round of interviews firms were selected that had a prominent history in the local industries. Snowball sampling to develop lists of key firms, and further sampling was done to reflect the range of sizes and activities within the clusters. In each case, three

rounds of interviews were conducted between 1996 and 1998. The first round involved intensive interviews with firms identified as leading and most knowledgeable business proprietors, and with directors of institutions identified within the clusters. These interviews included requests for further references.

The second round of interviews was intended to sample beyond the mainstream of local businesses. In this round, some informants were selected at random from local directories, and in the log home case, interviews ranged outside the core of the cluster in the Bitterroot Valley to include firms in the Swan and the Flathead valleys. Also pursued in this second phase of interviews were business proprietors that had been identified by other informants as having a significant role in the early emergence of the clusters.

Respondents for the third round of interviews were selected opportunistically, essentially, by wandering around the core of the districts. These interviews targeted variety and small scale; they included some very small shops, consumers, workers, and producers that appeared to have an ancillary relationship to the core of the clusters.

The acceptance rate of interview requests was quite high, and the main impediments to conducting them appeared to be scheduling difficulties. Most interviews were conducted at the work place, though there were some exceptions (for instance, one interview with a Port Townsend “tailgater” came out of a chance meeting in a local diner).

### *Content and analysis of the interviews*

Each interview began with a general description of the research project, and a verbal assurance of interview confidentiality. All informants were asked a core set of

questions identifying the firm and interviewer, the scale and scope of products, input and output markets, the internal workforce, and recent changes in all of these. A second line of questions concerned reasons for the businesses' location, how the establishment came about, the general attributes, advantages, and disadvantages of the area, the identification of shocks and periods of crisis, and how the cluster developed.

The third line of questioning concerned informants' relationships within the local industry, including contracting and competition, local inter-firm buy-sell relationships, and other types of exchange among firms. Typically, this part of the interview was most challenging and intriguing, because it appeared that important aspects of inter-firm relations was not embodied in exchanges of goods and services, but in friendships and tensions among proprietors. The nature of the responses about collaboration not only differed substantially from firm to firm, but also, responses typically they also evolved in the course of the questioning, as respondents' told stories and gave examples to describe their relationships. The final phase of questioning concerned the roles of formal institutions and the effects broader policy on the cluster. I also asked about the future prospects for the local industry. Finally, as a measure of size, all respondents were asked to identify the dollar value of the current year's sales from a set of categories.

As the interviews progressed, the business of gathering basic information became more efficient and the bulk of the time was taken up in the second and third parts of the protocol, concerning the development of local advantages and relations among firms. The first and second rounds of interviews typically lasted one hour to ninety minutes, and were often followed by a tour of the establishment. Interviews in the third round were

typically brief, about 15 minutes, and focused on verifying or elaborating on information already gathered.

As soon as possible following each interview, informant statements and other information were tabulated on the interview protocol form, and statements were transcribed. Some interviews with informants known to have a significant history in the local industry were tape recorded, and these were transcribed and used supplement the other data.

Following completion of the interviews, the results were aggregated for each case and descriptions of the clusters' scale, scope, products, and markets were developed from them. The general descriptions of the industry and its growth were supplemented by national descriptive work on the industries. Information both about the historical development of the clusters and about exchange and joint action was drawn from interviews with people directly involved. When discrepancies arose between interviews, I attempted to speak with the people most directly involved, reviewed the bulk of the evidence, and used judgment to reach my conclusions. The findings about historical development and collaboration in each case were validated through follow-up conversations with key informants.

## **Chapter 4: The Log Home Manufacturers of Western Montana**

The primary data for this case are drawn from intensive interviews with twenty firms in western Montana in 1996 and 1998. Because understanding cluster emergence was an important research objective, in the initial round of interviews firms were selected that had a prominent history in log home manufacturing in the Hamilton area of western Montana, this industry cluster's core. To reach a more representative population, these key-firm interviews were supplemented with interviews with small- and mid-sized log home producers, including firms located outside the Hamilton area, and among producers of ancillary products. The informants have what may be called situated expertise, meaning that they have intimate understanding of their own business and working knowledge of the industry.

In all cases, I asked informants first about their own operations, including questions about contracting and cooperation with others, and then asked them to characterize the area industry generally. Asking proprietors to speak about the management practices of others can be problematic, but it appears to be reasonable in this case. Firms interviewed represent about a quarter of all log home manufacturers in the state more than half of the total employment in that industry. Informants were able to comment about others that are like them. Cross-checking among interviews enables judgments to be made about those aspects of informant reports that are more or less reliable.

Such methods are irreplaceable for obtaining detailed information about the logic of firm behavior, but are more questionable as a means of understanding the more general parameters of the industry, because respondents often rely on secondary information that is often casually acquired. Knowledge of the industry does, however, inform these respondents' own risk taking, which gives it some credence. I take on faith informant statements about the broader industry, including the behavior of other firms, unless it is contradicted by other informants, or other more basic sources.

The following case study is presented in three main parts. The first part describes the basic industry and setting, sketching a brief history of log home construction, and describing the scope of activities that can be considered within the industrial complex. The second part describes cluster formation and district nascence, outlining the key location factors evident at historic moments of formation; considering general external economies that may account for growth in the log home industry; and describing the attributes of agglomeration observed today, including local external economies and collaborative efficiencies. The third section is interpretive and considers mechanisms of district development in light of divergent explanations observed in the literature.

### ***The industry and setting***

#### **The prefabricated wood building industry**

Historically, logs are a building material of convenience. With development, log construction was displaced by purchased lumber and standardized building techniques. For present purposes, it is sufficient to note the shift to balloon frame home construction,



using dimension lumber, as a sort of industrial economy that dramatically reshaped the industrial geography of construction (Cronon 1991).

The rise of lumber as a building material fostered the agglomeration in rural space of the lumber milling industry, an agglomeration that persists today. Gibbs and Bernat (1997) find that, today, primary wood products is the most agglomerated of all rural industries. Industrialization also routinized the business of construction and fostered the rise of carpentry as a specialized occupation. Hence, with industrialization the development path of the industry became bifurcated between the highly Tayloristic saw milling, and the more artisanal work of carpentry. This split was a geographical one, with carpentry located along market-center lines, and saw milling located in timber producing areas.

With the first counterurban settlement boom in the early 1970s, log homes reemerged as a preferred construction option. Part and parcel of the resurgence of log homes is their transformation from low to high-end building alternative. Log homes became a stylistic embodiment of rural settlement, a sort of frontier chic associated with moneyed Alpine resorts of the West. Market shifts embodied in the counterurban booms of the 1970s and 1990s greatly expanded the market for log homes in the nationally, but especially (for present purposes) in the west, creating external economies that fostered the general development of the industry. Log construction has shifted, in this time, from simple to complex in design, from modest to ostentatious in size, and from cheap to expensive in price.

Market growth is not the only external economy that fostered the resurgence of the log home industry. Technological and pecuniary (i.e., input-cost) advances also played a role, among them, the application of computer assisted design to log home manufacturing, development of technologies for log latheing and insulating, and routinization of notching and coping techniques. Among the notable technological advances was the reemergence of hand-crafted log building, particularly the technique of crafting log homes at central locations, for disassembly and shipping to the building site. This last appears to be prominent in the western United States.

The log home industry is classified for Standard Industrial Classification purposes within "prefabricated wood building manufacture" (SIC: 2452<sup>29</sup>), a category that includes log homes and an assortment of other prefabricated buildings (i.e., coops, barns, corncribs, marinas, geodesic domes, and other prefabricated wood homes) and building components (i.e., floors, sectional panels, and saunas). The category excludes mobile homes and fabrication of wooden housing components on the building site. The most recent detailed figures on this industry are from the 1992 industrial census (US Dept. of Commerce 1994). In a supplemental document, the value of product shipments have been estimated through 1996 at the five-digit SIC level (US Census Bureau 1998).

To help place this case study in context, it is useful to summarize available research about the industry nationally. The five digit SIC code 24522 appears to be the

single best statistical proxy for the log building industry afforded by current census categories.<sup>30</sup> That code includes three major product classes: (a) log homes, (b) prefabricated nonresidential buildings, and (c) townhouses and apartments<sup>31</sup>, all of which are specified as complete pre-cut, disassembled, wooden buildings (i.e., they are neither components, or panelized buildings, nor are they shipped in three dimensional assemblies). Log home shipments account for 16 percent (\$406 million) of the total 1992 shipped value in SIC 24522. My interviews with log home manufacturers suggest that, at least in Montana, the second (and largest) of these product classes, *nonresidential* lodges and other commercial structures, constitute a large and growing share of log building production, suggesting that log construction constitutes some fraction of this product classification as well. Only the last product class is specified as non-log construction, and this accounted for 21 percent of the total value of SIC 24522 shipments in 1992.

It appears that the growth of the log building sub-component of industry 2452 has been comparable to, if more stable than, the classification as a whole (US Dept. of Commerce 1994; US Census Bureau 1998). Census documents break out growth figures into product sub-classifications for SIC 24522, and these indicate growth in value of log home shipments between 1987 and 1992 of about eight percent, shipments of commercial buildings increased threefold, while townhouses and apartments declined to half their

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<sup>29</sup> The North American Industry Classification System (NAICS) replaced the SIC in 1997. The NAICS number 321992 is analogous to SIC 2452. There appear to be no changes in this classification relevant to this discussion.

<sup>30</sup> I refer to the industry as the "log building industry" in this section only. In the remainder of the dissertation, I follow the standard parlance in the industry with the term "log home" industry in reference to the population of firms engaged in the prefabrication of log buildings of all types, commercial and residential.

1987 value. In aggregate, SIC 24522 grew by about 8 percent between 1987 and 1992 and grew again in the 1992 to 1996 period, adding another (estimated) 6 percent of total shipped value. By comparison, the SIC 2452 declined to 88 percent of its 1987 value by 1992, but gained (an estimated) 25 percent of shipment value between 1992 and 1996.

Census documents also permit some observations to be made about the geographic distribution of the log building industry. In 1992 eleven states accounted for nearly 40 percent of the total shipped value of \$406 million in SIC 24522. The largest producing state was Tennessee, which accounted for 8 percent of the national total. Also notable are five eastern states (Pennsylvania, Michigan, Maine, New York, and Connecticut) which together produced 18 percent of total value in SIC 24522. Missouri is the lone midwestern state on this list, accounting for about 2.5 percent of national production. Three western states accounted for about 10 percent of national production. Of these, California was the largest producer, with \$27 million, followed by Montana with \$9.5 million and Washington with \$2.3 million. Montana producers accounted for about 2.3 percent of national production and stood as the eighth largest producing state in SIC 24522. Log home production appears moderately concentrated in a few states of the Northeast, South, and West, with relatively sparse production in the midwestern states. Montana is by no means the dominant producing state nationally, but it does have the largest concentration of production in a vast territory spanning the Northwest, Rocky Mountain, and Midwest.

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<sup>31</sup> Product codes 24522-17, -23, and -19, respectively.

Since SIC 24522 is comparable in growth and establishment size to its broader classification, prefabricated wood building (SIC 2452), some general comments about the structure of this industry can be gleaned by comparing it with the mobile home industry (SIC 2451), the products of which are most similar.

In general the prefabricated building industry appears to have taken a "small firm" development trajectory in recent years, and this is quite marked by comparison with the mobile home manufacturers. 1992 census counts show 655 prefabricated wood building establishments and 19,000 total employees (an average of 29 employees), compared to 286 mobile home manufacturers and 37,000 employees (129 on average), and a much larger proportion of small, independent proprietorships in prefabricated wood building. In the 1977 to 1992 period, average employees per establishment were on diverging paths, with the average size of prefabricated wood building establishments declining from 51 to 29 employees, while mobile home manufacturers grew from 85 to 129.

Three further observations lend support to the idea that the prefabricated wood building industry and log building manufacturing within it, are tending toward a small firm trajectory of development, with all that implies for a flexible specialization interpretation of the industry.

- A significantly greater share of both work and pay are dedicated to nonproduction activities in prefabricated wood building as compared to mobile home firms. The proportion of workers and wages in non-production activities, such as management, technical, and marketing functions, is a rough gauge of management and engineering

intensity of the firm.<sup>32</sup> The average proportion of production to all workers is somewhat lower among prefabricated wood building (71 percent) than mobile home (84 percent ) manufacturers, and it is still lower in the SIC 24522 classification (62 percent). More than 41 percent of payroll for prefabricated wood building (and 47 percent for 24522) is for nonproduction workers, compared with 29 percent in the mobile home industry.

- Nonproduction wages absorb an increasing share of value added.<sup>33</sup> Between 1977 and 1992 the ratio of payroll to value added rose among prefabricated wood building firms and fell among mobile home manufacturers. In the same period, the share of production wages of the two remained very similar; production wages in prefabricated wood building were \$9.65, compared to \$9.40 for mobile home labor. Increasing shares of value added going to management, marketing, and technical functions suggest heightened competition on the basis of information, process, and design aspects of production.
- Merchandising transactions and contract work are relatively important. The prefabricated wood buildings industry engages in more merchandising transactions and production chains. Nearly 3 percent of all goods sold are unprocessed, that is, bought and resold without further processing (i.e., merchandising), and over 4 percent of the cost of goods is in contract work. These figures may not be particularly high

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<sup>32</sup> Glasmeier (1991), for instance, defines high technology in terms of the proportion of the workforce in engineering.

<sup>33</sup> Formally, value added is the value of goods shipped net of non-labor input costs and adjusted for changes in goods on hand. The ratio of payroll to value added reflects the share of value added consumed in wages as opposed to profits.

among industries with highly developed divisions of labor, but they are markedly higher than the mobile home industry.

### **Site and Setting: Log home manufacturing in the Bitterroot Valley**

The focus of this case study is a cluster of log home manufacturing firms in Hamilton and the Bitterroot Valley of western Montana. Hamilton (pop. 3000) lies in Ravalli County (pop. 25,000) about 50 miles south of Missoula, on the western edge of the state (Census, 1996). This area is, by every measure, the epicenter of the state's log home manufacturing industry. Ravalli County is the dominant center for this industry in the Rocky Mountain and northwestern states.

Four general features of the area are remarkable. One is its rapid growth. In this decade Ravalli county has been the fastest growing county in the state (Fossum 1997) and one of the top three fastest growing counties in the Northwest.<sup>34</sup> The Bitterroot Valley is quite scenic, and its adjacency to (recently declared) metropolitan Missoula County places the area at the intersection of amenity-oriented and commuter settlement patterns that have been prominent in the West in recent years. These informants reported very little reliance on local markets, suggesting that the industry is not a derivative of local growth, but a primary exporter. The growth of the log home industry contributes to the county economy, but does not dominate it. Some informants suggested that rapid growth in the immediate area may be an antagonist to industry growth in Ravalli County. It is

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<sup>34</sup> Between 1990 and 1994, Ravalli County's average rate of net migration was more than 4 percent per year, a rate surpassed by only two counties in the four Northwest states: Boise and Kootenai (both in Idaho). These three counties are strikingly similar in their situation, being on the forested fringe of small metropolitan areas (Missoula, Boise, and Spokane, respectively).

plausible that recent population growth may raise location costs and, on balance, heighten centrifugal forces on log home producers in this region.

Second, the area is surrounded by vast forests, much of them on United States Forest Service land. Mature lodgepole pine, the preferred species for log home manufacturing in the West, is common in these forests. Over the years these mature forests have been prone to disease and fire kills, which is significant because standing *dead* trees are preferred by most area log home producers. (Since standing dead trees dry and shrink straight, settling in the finished log home is significantly less than when green trees are used. Standing dead trees are also preferred by some producers and consumers for environmental reasons.) Most producers interviewed reported log supply as a significant location advantage, although availability of house logs has declined in recent years. The cost of standing dead house logs, which were nearly free in the early 1970s, are today substantially more expensive than comparable green trees.

Third, for an alpine area, the Bitterroot Valley enjoys relatively mild winters. This and its proximity to the alpine amenity areas in Colorado, Idaho, Utah, Wyoming, and Montana were cited by producers as a significant location advantage. As with log supply, the area enjoys a degree of market centrality.

Finally, the location has a relatively high rate of all manufacturing. Although Ravalli County has grown dramatically as a commuter hub, it remains strong as a site of manufacturing, whether measured in employment or establishment terms. Its 900 manufacturing jobs are 125 percent of the national average rate of manufacturing jobs per population, and its 90 manufacturing establishments place the county in the 196



percentile (Montana as a whole lies at the 39<sup>th</sup> and 115<sup>th</sup> percentiles) (US Census Bureau 1996).

County Business Patterns statistics (1996), which are consistent with the industry-wide figures cited above, show 308 employees and eleven establishments in Ravalli County in SIC 2452 and 25 establishments state-wide.<sup>35</sup> By this reckoning, Ravalli County accounts for about 1.5 percent of the industry nationally, in both employees and establishments. This estimate is substantially lower than more detailed studies of Montana's log home industry, but it does enable calculation of a location quotient.<sup>36</sup> Comparing employment in Ravalli County to the United States for SIC 2452 yields a location quotient of 231, suggesting that the industry is well over 200 times as prominent in Ravalli County as it is in the United States as a whole. These figures support the conclusion that, although the county accounts for a rather small proportion of the entire prefabricated wood building industry, it is remarkably concentrated there.

More comprehensive surveys of the industry in Montana have been conducted by the Bureau of Business and Economic Research at the University of Montana (Keegan, Wichman et al. 1991; Wichman, III et al. 1994; Keegan, Wichman et al. 1995), and these provide larger estimates of the state's industry than the CBP figures just described. The most recent survey of Montana's log home manufacturing industry (Wichman, III et al. 1994) placed its size, in 1993, at over 60 firms and 660 employees. Of that, Bitterroot

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<sup>35</sup> Employment statistics for all other counties, and the state, are suppressed in County Business Patterns.

<sup>36</sup> In general, a location quotient of 1.0 indicates presence of an industry in an area equal to that of the country as a whole, with larger figures suggesting that the industry exports.

Valley log home firms accounted for 24 establishments.<sup>37</sup> Based on my research, these sources seem more credible than CBP and Census estimates noted above. In addition, the abundance of larger firms in the Bitterroot Valley suggests that the area's share of industry employment is a larger proportion of the state total. The eleven Bitterroot Valley firms I interviewed reported about 480 employees.

Firms may be categorized by size into three tiers. At one end are a few firms over 50 workers; there is a broader middle size, employing in the range of 25 to 50 workers; and there are many with fewer than 25 workers. Nearly all log home manufacturers interviewed are incorporated, and all are privately held.

### The Industry in Place

There are two dominant variants of log home manufacture in the Bitterroot Valley. The first is *handcrafted*, in which logs are peeled and worked manually using rather simple tools: chain saws, drawknives, adzes, calculators, and heavy machinery such as cranes and small sawmills. Building shells are fully constructed at the manufacturing site, then disassembled for shipping to the building site. Handcrafting is artisanal work. As such, it is not highly amenable to Tayloristic standardization of production labor. The process of centralizing production does, however, enable significant economies to be achieved in the management of training, equipment, material, and marketing.

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<sup>37</sup> The Bitterroot Valley includes parts of three counties. Those firms listed in the cited directory in Ravalli, Missoula, and Beaverhead Counties, *and* reporting Bitterroot Valley addresses were tabulated to this area.

In the second variant, logs are *machined* to uniform dimension using lathes or mills. Machined logs are further milled for specific building uses, which principally involves coping (in which the bottom part of a log is contoured to sit flush on the log below) and jointing (the predominant style of log corner joinery is the saddle notch). Complex finished cuts may be made to log ends as part of the manufacturing process, though in many cases this is a step completed at the building site. Machined logs are commonly "hand peeled" or hewn with an adz to give them a handworked look.

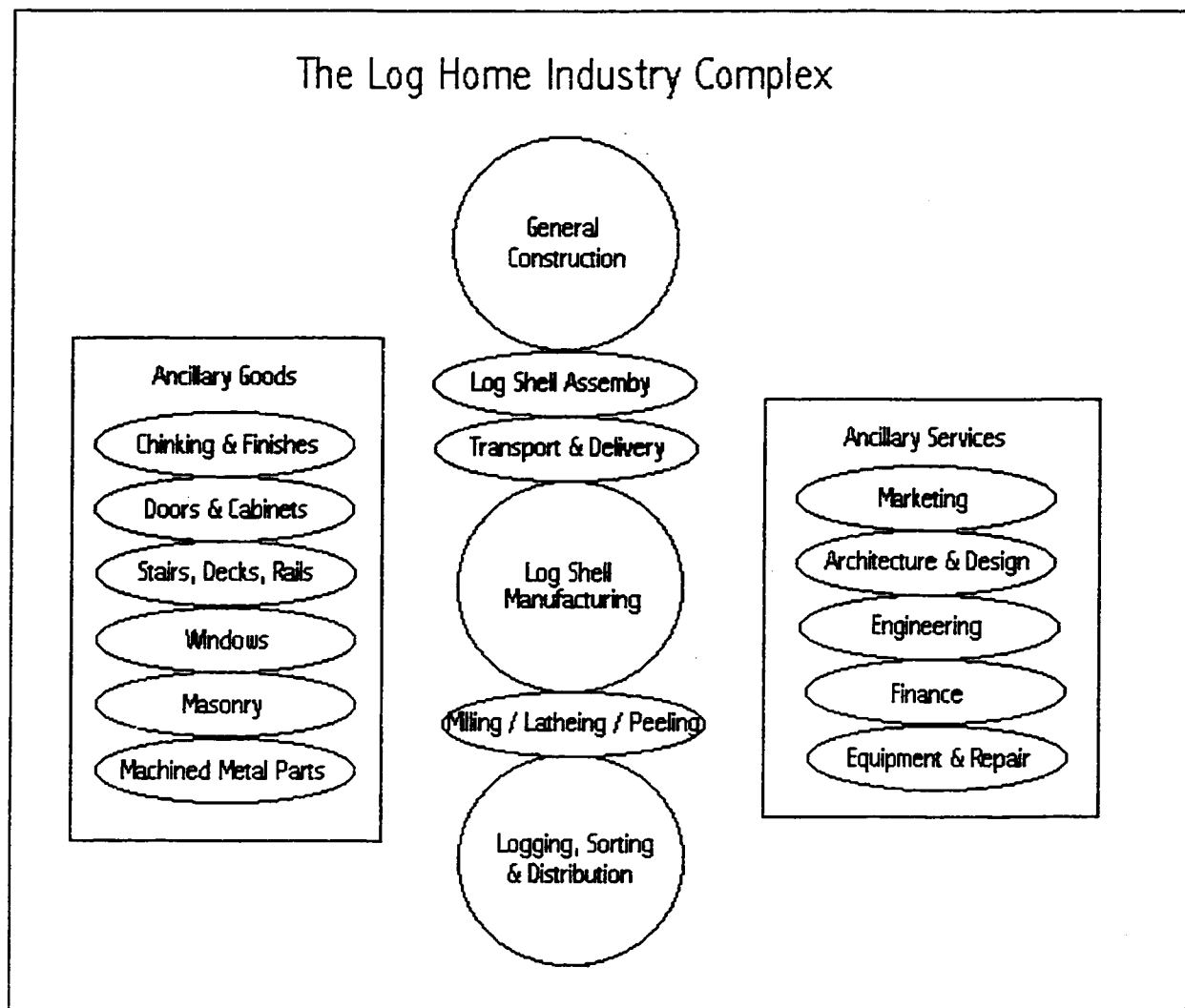
Both methods result in a disassembled package of logs, which are shipped to the construction site for assembly and finished construction. Each method embodies changes in technology and organization that facilitate manufacturing at a centralized location and breaks with the historically decentralized routine, in which raw logs are delivered to the construction site for sorting, peeling, hewing, fitting, and assembly. Hence, the rise of centralized facilities reflects new industrial economies, which permit the concentration of the industry. Even among larger scale and more mechanized producers, the great majority of log homes are manufactured to custom design.

The methods used in machined log home manufacturing predate the development of this cluster. The method of industrially centralized handcrafting, however, was reported to have been developed by Alpine Log Homes, of Hamilton, Montana, which (directly or indirectly) is the progenitor of most handcrafted log home manufacturers in the area. Neither innovation involves proprietary technology or complex organizational systems. As a result, imitation of the manufacturing processes outlined above is relatively easy.

### Attributes of the complex

The products of the log home cluster of western Montana range from small cabins and homes to major commercial lodges and retail buildings. Industry analysts have estimated that the manufacturing process generates ten times the direct employment of routine sawmilling and plywood production (Wichman, III et al. 1994). By competing in national and international markets, the log home industry in Montana grew at an annual rate of 7 percent between 1976 and 1993. My interviews suggest a similar pace of growth since then. This expansion has encouraged a broader complex of firms in design and engineering, chinking and finishes, doors, windows, cabinetry, and post and pole specialties. The industry's high value-added, fast growth, and established advantage in the state has led some to call it Montana's "dream industry" (Pulchini 1991).

Figure 4.1 shows the log home industry and its major affiliated sectors: the input and output sides, and ancillary goods and services producers. The rough outlines of the industry are similar between machined and hand crafted firms, although because machined log home manufacturers tend to have higher costs of entry, their average size is larger, and they tend more to integration of ancillary functions. In the typical case, house logs are purchased from loggers, mills, or log brokers. The manufacturer prepares the logs, by milling or hand peeling them. Line labor entails production of the building shell kit, which is shipped to the construction site for assembly and finished construction. The manufacturer routinely arranges for assembly of the shell at the building site, a step that is often contracted to the primary shell manufacturer.



*Figure 4.1. The log home industry complex*

**Markets.** Few log home manufacturers undertake finished construction. In only two of the twenty firms interviewed did the log home manufacturer report regularly undertaking finished or semi-finished construction, and both these cases were outside the Hamilton area. When working with contractors less familiar with log construction, log home manufacturers commonly take charge of reassembling the delivered shell on site;

either by sending a crew or foreman familiar with log assembly, or by contracting for assembly to a small firm that specializes in it.

In the typical case, the log building shell is sold directly to a housing contractor that has some special expertise in log home construction. Routine working relations between manufacturers and building contractors accounted for the nearly 54 percent of sales by Bitterroot Valley handcrafters, the largest single source of sales reported by this group. The need for trust and stability in these relationships was evident in the interviews and wholly consistent with Scott and Storper's (1987) logic: repeated, detailed, and technical transactions put a premium on intimacy in producer-contractor relations. It is notable that repeated and personal linkages between distant building contractors and manufacturers was less prominent among other firms interviewed – machined home manufacturers, ancillary goods producers, and manufacturers outside the Bitterroot Valley than among the Bitterroot Valley handcrafters.

The proportion of sales reported through agent affiliates and in-house marketing was nearly as large as direct linkages to contractors. In aggregate the importance of these types of channels can be differentiated by place and type of producer. It appears that machine manufacturers, and all producers outside the Bitterroot Valley, rely more on their own marketing operations to generate sales than they do on the types of contractor relationships just described. The present interviews suggest that in-house marketing efforts generate the great majority of sales for those firms.

Firms on a growth trajectory experiment with different forms of market representation. Some of the larger firms, particularly the machine manufacturers have

taken a more formal approach to establishing a diffuse network market representatives and sales of franchises, while the smaller firms typically keep a local sales staff. Word-of-mouth referrals from customers are also important. While all *growing* firms advertise in national media, not all manufacturers see the need to market aggressively. Some get ample business from customer referrals, from established contractor relationships, and subcontracts from other log home producers. Finally, Ravalli County log home manufacturers report that the extent and reputation of the cluster induces some distant purchasers to "shop" the valley, assessing the range of styles and eliciting competing bids from area manufacturers.

The small size of this sample and the selective nature of the sampling (especially outside the Hamilton area) does not enable population estimates, but this research does suggest that firms within the core of this cluster are substantially more oriented to interstate trade than are more isolated producers. Bitterroot Valley log home manufacturers seldom report that Montana is a primary market for them. Wichman (1995) estimates the in-state market for all log home manufacturers at 20 percent. My sample suggests that market reach varies by both firm type (handcrafted or machined) and location (Bitterroot Valley vs. elsewhere). Machined log home manufacturers in the Bitterroot Valley, for instance, reported little or no in-state market; outside this location, the reliance on Montana markets was greater (25 percent). Hamilton area handcraft manufacturers reported an average of 9 percent sales instate; while the few comparable firms in other locations report more than half their sales in Montana.

The primary external markets identified were the alpine amenity areas: Aspen and Telluride, Colorado, Sun Valley, Idaho, and Jackson Hole, Wyoming. The dramatic recent influx of new residents to many parts of the mountain West means that regional growth markets are becoming more common and diffuse, and the in-state market is growing as part of this general trend.

A significant share of sales (about 40 percent) reaches beyond this “home market” area, and here the picture grows more complicated. Some firms reported strong markets in the upper-midwestern states of Minnesota, Michigan, and Illinois, other firms have links to Texas, Washington, and California. Some firms reach well beyond the West, into the East and export markets. Machined log home producers report less reliance on the regional market, with about one third of all sales in Montana and the Rocky Mountain states. All log home manufacturers outside the Bitterroot Valley also report diffuse markets. Interestingly, no respondents reported Canadian sales. It seems clear that many markets, both in and outside the region, are a product of developed linkages that were embodied in historic relations with construction contractors, sales agents, and consumers. The greater prominence of machined log homes in the Midwest and East probably reflects regional differences in style or preference, but historic ties cannot be ignored.

Firms specialize not only by design and product configurations, but also by differences in historic market presence. Two firms that reported strong sales in Michigan have organizational roots in that state and maintain strong connections there. Similar connections by other firms can be drawn to Texas, California, and Alaska as well as to specific areas within the Rocky Mountain region.



During the interviews, I asked how the market area has changed over the last five years. Responses describe a broad picture of regional markets growing on the strength of a general construction boom. Coastal states and export destinations in the Pacific Rim appear to have declined due to relatively soft economic conditions and increasing competition from producers on the West Coast and Canada. Markets in the midwestern, southern, and eastern regions were expanding. The cost of trucking log packages somewhat limits the prospects for expanding into the far South and eastern United States. Nonetheless, some firms have developed advantages, based on the strength of their service, design, and product quality, that allow them to compete against major centers in Tennessee and the East.

**Technology.** Handcraft manufacturers begin with a modest equipment investment: a mobile crane, forklift, truck, and hand tools. As they grow, equipment needs expand to include additional cranes, trucks, forklifts, log milling and shaping equipment, and, in some cases, enclosed production facilities. Firm growth also affords the addition of computer assisted design (CAD) capacity, including drafting and design staff; functions that, among smaller firms, are contracted or left to the purchaser and builder. While most equipment used by handcrafters is basic – facilitating, not supplanting, skilled labor – larger handcrafting firms estimate that their investment in machinery and equipment is no less substantial. Many firms employ mechanics and report turning to area machine shops and distributors for parts and repair. Machined log home manufacturers begin with a higher investment in latheing and milling devices and appear to have a larger minimum size. Most informants reported designing their own

equipment and having it fabricated by area machine shops, although at least one had purchased latheing equipment from Europe. While many have trucking capacity sufficient to move logs within the immediate area, transportation of products in and out of the area is provided by private vendors.

***Supply.*** Once practically free, dead house logs have for at least a decade exceeded the price of green wood, and that price gap has grown in recent years. Today, standing dead trees suitable for log home building cost producers 50 to 100 percent more than comparable green house logs. Concurrently, log homes have shifted from low to high cost, as a construction alternative. The rise in price of log homes is, in part, a factor of declining availability of high quality house logs. Several adaptive changes may be associated with rising material costs: (a) log home producers are purchasing logs from more distant sources, including Canada and the Pacific Northwest; (b) producers now use more diverse species of wood for house logs, and some substitute green trees for standing dead ones; (c) house log brokering has emerged in the area as a specialty business; and (d) some larger firms are integrating backward into forest management.

***Ancillary producers and services.*** The log home industry extends to goods that are part and parcel of the log building shell, including inside log walls, stairs, and post rails. Although construction contractors are important as a downstream linkage, the normal scope of the industry does not include finished construction with its diverse materials and fixtures. The industry can, however, be construed to include certain components that are stylistically or functionally specific to log homes. In that category are some cabinets, doors, windows, porches and rails, chinking and finishing.

Typically, log home manufacturers in this cluster avoid contracting for more than producing and assembling the shell. Although several reported having experimented with more embodied goods, the present norm includes little beyond the building shell, interior log walls, stairs, and rails. Most of my informants expressed a strong preference to let the construction contractor find ancillary parts themselves. Two dominant reasons for this were reported. First is risk avoidance. These manufacturers tend to avoid packaging subcontracted goods (such as chinking, masonry, and millwork) into their contracts as a means of reducing their financial liability for performance. The second is customization. Log homes are today a premium construction option, and most buyers and homeowners prefer to maximize customization and uniqueness. The result is that, with few exceptions, ancillary goods are sold directly to housing contractors who are geographically diffuse. This would seem to discourage the clustering of specialized ancillary producers around the log home cluster and, lacking a strong pattern of local linkages to log home producers, raises questions about why ancillary goods producers specializing in log home components are found in the cluster.

Ancillary goods producers present in this cluster (shown on the left side of *Figure 4.1*) include chinking and finishing (i.e., wood stains and sealants); doors and cabinets; stairs, decks, and railings; windows; masonry; and machined metal parts. Such ancillary goods are rarely produced by log home manufacturers. The same cannot be said of ancillary services and equipment (shown on the right side of *Figure 4.1*), which include marketing, architecture and design, engineering, finance, and equipment and repair. These later functions appear to be more prone to integration, especially among larger log

home manufacturers. All the ancillary goods and services mentioned here are components of other industries. By no means can their size or growth be directly attributed to the log home industry. Some exceptions exist, including chinking and house log brokers, though even these are categorized (for statistical purposes) with other producers.

*Product and market differentiation in log home manufacturing.* Firms' different product offerings and market linkages reflect distinctive niches. In practice the various processes of production (presented above as a dichotomy of machined and handcrafted) are consciously combined and blended with other construction techniques. One example entails hand worked joinery on sawn cants of two, three, or four sides. Another incorporates post-and-beam construction with log materials and design. Many homes leave the area with both hand worked and machined components, such as the use of large milled logs as door or gable accents in a handcrafted structure, or the addition of hand worked or of milled faux-log siding in portions of a machined home. Log home manufacturers differentiate themselves by production method, different styles of notching and coping, fulfillment services at the home site, and by their ability to obtain logs of specific size or species.

Product distinctions often reflect the firms' different geographic markets. Machined log producers, for instance, tend to export farther to the east where (informants report) machined log building is more typical. Such distinctions can be drawn more finely. Dovetail joinery is traditional to the eastern states (as opposed to the saddle notch

more typical in this region). Firms using that technique tend also to be active in those markets.

Consistent with Wichman et al. (1994), the present interviews suggest that the area industry has turned increasingly to production of large scale, commercial buildings. In this segment of the market, the term “log home” becomes a figure of speech for major projects that run from mansions to retail buildings and resort lodge complexes. This focus is quite pronounced among the larger and more established firms and is influenced by (a) increasing cost of materials, which has made log homes an increasingly expensive building option, (b) competition from small and diffuse producers for smaller jobs, and (c) the capacity these mid and larger sized manufacturers in this cluster have developed to undertake large jobs. As wood prices have increased and competition stiffened, producers in the Bitterroot Valley have developed a competitive advantage in production of large, commercial buildings.

The above discussion has identified a few features of this cluster, which provoke more detailed discussion of the case as a district. Among them:

- Figures available at the national scale are consistent with the observation that this industry is developing on small firm trajectory.
- Loyal relations between log home manufacturers and distant construction contractors appear to set Bitterroot Valley hand craft producers apart. This population of producers appears to get more than half its sales through direct contractor relationships, far more than is reported by other types of producers and those in other

locations. In no case were these relationships obligatory.<sup>38</sup> To the contrary, most were described as personal ties of loyalty and friendship.

- Since log supply limits what jobs can be bid for, the ability of log home manufacturers to get house logs is an object of intense competitive strategy. Supply problems were, in themselves, rarely fatal within the firms I interviewed in the Bitterroot Valley. These firms have developed a variety of ways to get the logs they need, and while the sources of supply differ by firm size, these interviews suggest that supply methods and management have become a source of competitive advantage within the cluster, enabling these firms to persist (if not thrive) in volatile input conditions. As will be discussed, even though firms are very guarded about their sources and tactics of log acquisition, once the logs they need are in hand, many producers trade them among themselves.
- The capacity to compete at the high end of the market for large and commercial jobs has become an increasingly critical aspect of the log home industry, and in this area, too, Bitterroot Valley appears to have developed a distinct advantage. High input prices coupled with the growth of market-diffuse small producers have made smaller contracts more competitive with lower margins. While manufacturers in this cluster have by no means yielded the market for modest sized buildings, many have established a new dominance in production of commercial-scale buildings. That

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<sup>38</sup> The nearest exception is indicative of why the relationships between construction contractors and log home manufacturers resist formal integration. Idaho-Montana Log Homes was actually formed as a production subsidiary of a Sun Valley design firm, but the subsidiary is responsible for managing its own demand, and the internal market of the parent firm is insufficient and too discontinuous to make an obligatory contracting relationship workable.

these manufacturers have collectively, at the same time, extended market reach and expanded product offerings suggests a level of tactical intelligence well above the norm for smaller, more isolated producers of log homes.

*Development sequences in district development: The emergence of log home manufacturing in the Bitterroot Valley*

This section examines the case of the log home cluster in terms of its historical development. The object is to trace key aspects of district development over time.

I have previously suggested that district formation consists of three development dynamics, which progress in a rough sequence of location, externalization, and agglomeration. For purposes of discussing district development, we may discuss these three dynamics as moments of cluster formation. The first addresses location by a few key firms. The second entails the expansion and proliferation of firms. The third examines the thickening of the cluster and the amassing of district benefits. Let us keep in mind, however, that the general sequence of location, externalization, and agglomeration may apply equally well to diversification and the expanding scope of an established district.

I have also outlined three major expectations about district formation that are elaborated in the literature. One holds that a cluster of businesses arises first, only later to develop significant features and benefits of a district (clusters first). Another holds that districts emerge through the disintegration of previously integrated firms (disintegration and contracting). By this view, passive (pecuniary and exogenous) external economies become embedded in an area, such that as external forces shift from favoring internal to

external divisions of labor, the organization of the industry remains localized. The third holds that districts are merely one expression of an innovative local milieu that is constituted by a community of technical and managerial problem solvers (innovative mores).

In the late 1960s five log home manufacturing firms operated in Montana, and these were dispersed around the western part of the state. Among them were Rocky Mountain Log Homes in the Bitterroot Valley, National Log Home Manufacturing in Thompson Falls, Rustic Log Homes in Seeley Lake, and Model Log Homes in Gallatin Gateway. At the time of these interviews, only two of these (Rocky Mountain, and Model) were still operating.<sup>39</sup> I spoke with Mark Neville, whose family established Rocky Mountain, in Hamilton in the early 1960s. According to Mark Neville's report, his father, Dick Neville, designed a spindle lathe to help build his family's home and developed a log home manufacturing business as a product of snowballing requests and referrals from consumers in the surrounding area.

Among the firms included in my interviews, Alpine Log Homes is almost certainly the most historically significant firm in the Bitterroot Valley. That firm moved its small operations from Colorado to the Bitterroot Valley in 1973, one year after it was started. The firm was operated by Ray Vandecar, Ken Theurbach, and Keith Robinson, who claim that Alpine developed the method of hand crafting log buildings at a central site for disassembly and shipping to the building site. When Alpine located in Hamilton,



it brought with it established linkages to construction contractors in Colorado's resort communities. Asked to describe why they picked this area to settle in, Theurbach and Robinson named proximity to cheap house logs, the mild climate, inexpensive labor ("farm kids," they said), as well as the accessibility of Alpine resort centers in surrounding states. Vandecar also had family ties in the area. Interestingly, this was the only case in which there was clear evidence of a classical location decision process that weighed the basic supply and market factors of alternative locations.

Ken Theurbach today owns Alpine, which is the single largest producer of handcrafted log homes in the Bitterroot area. He is a Harvard MBA, a brilliant manager, and a well recognized exponent of the area industry. As an informant, he spoke of the early days of Alpine in the Bitterroot Valley in terms of the conscious revival of the craft of log building. By that time, he notes, 95 percent of log homes were machine made. The problem for Alpine, he said, was twofold. First, "was to find a way to get a generation of old-timers to train a generation of new craftsmen. There is a family tree to it." Second, was to find a management model suitable for industrializing what had been a small-scale craft performed at the construction site. Theurbach notes that the management model for Alpine was patterned after the Tiffany glassworks. Hence, Alpine takes credit for two innovations. The first is the process of stacking and disassembly, which enables the centralized production of handcrafted log buildings.

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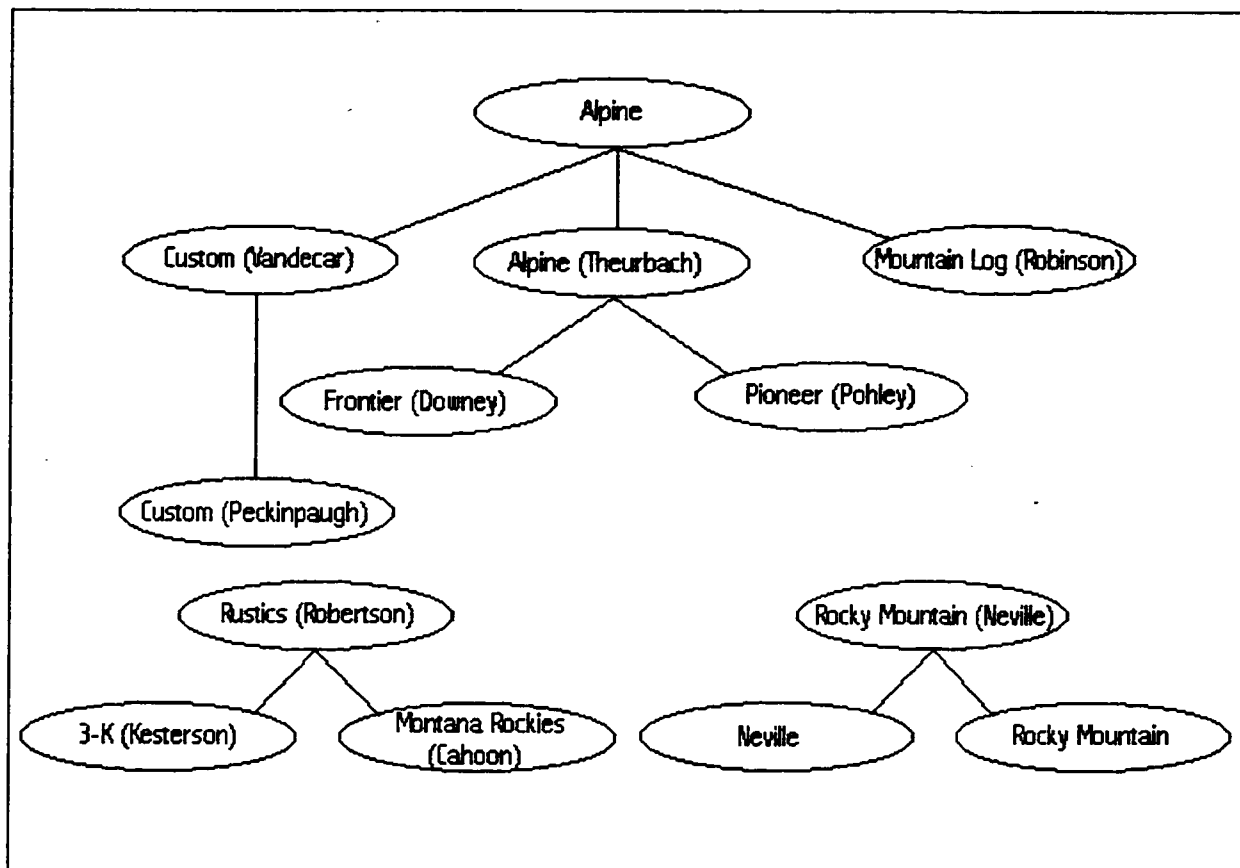
<sup>39</sup> A third firm had gone bankrupt and been reformed as a different business. Notwithstanding, its slightly altered name and new management, the operation is much the same, and I treat it below as a continuously operating firm.

Second, and more broadly, is in developing management and organizational methods to enable the revival and industrialization of the craft of hand-fitted log building.

The emergence of log home manufacturing as a clustered industry can be placed in the period between 1973 and 1976, when the number of log home manufacturers expanded from 5 to 19 firms statewide (Wichman, et al. 1994). That expansion was concentrated in the Bitterroot Valley.

My interviews suggest that a main mechanism of this expansion was firm fission – the splitting off of workers from existing area businesses into new ones. Figure 4.2 shows some examples of firms that split off. Alpine appears to be most prolific as a progenitor of new firms. In Alpine's case, the firm's major partners separated (in about 1975) to form three enterprises: Alpine, Custom Log Homes, and Mountain Logs, each of which remained in the immediate area. Others followed in subsequent years, notably Frontier and Pioneer. This manner of firm formation appears to be more common to handcrafters, but is not unique to them. Dick Neville sold Rocky Mountain and started another log home manufacturing firm. Interviews conducted in the Swan Valley also show firm formation through fission in the case of 3-K Log Homes and Montana Rockies Log Homes, which had origins in Rustic Log Homes. By no means is the figure exhaustive; these examples appear representative of a manner of new firm formation that is common in the industry. Firm fission does not appear to be unique to the Hamilton area. It does seem, however, to be more common among handcrafted producers, a product of the craft organization of production and smaller viable operating size.

The case of Neville and Rocky Mountain, a machined log home manufacturer, is distinctive in that it represents a firm sale, after which the entrepreneur started another log home manufacturing business. It is worth noting, however, that all of the firms shown in this figure but one remained in the area, or (as in Neville's case) returned to it.<sup>40</sup>



*Figure 4.2: Some examples of firm fission in log home manufacturing firms*

When questioned about the logic of their location, the group of spin-off firms noted cheap logs and less expensive labor than the alpine resort areas. From the earliest

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<sup>40</sup> After selling Rocky Mountain, the Neville family opened a new log home manufacturing firm in Sandpoint, Idaho. In 1983 the firm relocated to Hamilton. Neville is today second only to Rocky Mountain in size among machined log home manufacturers in the Bitterroot Valley. In another instance,

stages of the proliferation of firms in the Hamilton area, firms had an awareness of the input (logs, labor), output (market) advantages, but also noted the information and market benefits of having other nearby producers. Some simply noted that the location decision was more residential than industrial. A typical statement: "This is where the business was."

But why did the firms divide? Did the separation and formation of new firms entail a division of labor and contracting, as anticipated under the transactional interpretation of district formation? Or did the firms simply separate, only later to develop the means and benefits of agglomeration, as the clusters-first interpretation maintains? In only one case was routine contracting reported as an early feature of the division of Mountain Log (Robinson) from Alpine (Theurbach). Routine contracting with the parent firm was not a prominent early feature of cluster formation.

Classical location theory is often discussed as if it entailed a rational analysis of alternative locations by footloose producers. It is notable that, in the cluster formation period of this case, only one instance of such a location analysis could be identified. It seems profitable to set aside the conception of location as a cognitive process and ask instead why similar firms thrive differently in different places. The contrast of the Bitterroot Valley to the nearby Swan Valley is illustrative<sup>41</sup>. In both areas, new firms appear to have arisen about the same time, and in the same manner, through spin-offs and the exit of workers from a few prolific parent firms. Their input and output markets are

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Vandecar is reported to have started another log home firm out of state, after selling Custom to Peckinpugh.

similar. In one case, firms clustered and a district emerged. In the other, firms appear to have clustered to little dynamic effect. What's the difference?

First, as noted, influential early managers in the Bitterroot Valley had in mind a conscious revival of craft, and the spinning-off of firms in the Bitterroot Valley was an anticipated part of that. As firms separated, bonds of kinship and rivalry were maintained. The spinning off of firms does not appear to reflect a curtailment of the impulse to internalize the benefits of production. While Bitterroot Valley informants do work to internalize their advantages, however, they appear to have acceptance of workers as potential neighbors and competitors. This seemed to me a trifling issue until I saw the contrast between this and the close, Fordist norms of saw milling that is the managerial benchmark of rural communities in this region. Neo-Fordist management is writ large in The Rustics, the main parent firm in the Seeley-Swan Valley. The Rustics appears to be vexed by the exodus of its workers and their emergence as local competitors. Having failed and reorganized as a new firm, its management today reports discouraging firm spin-offs by flexibilizing its workforce. Workers at this firm are piece-rate contractors, and the firm reports making moves to displace its production to Mexico.

Second, both Neville (Rocky Mountain, at the time) and Alpine appear to have invented something (respectively, a spindle lathe and the technical and management methods of centralized handcrafting) that was easily replicated and so generated external economies and fostered general growth of the industry.

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<sup>41</sup> The town of Seeley Lake lies about 90 miles north of Hamilton; Seeley Lake is the southern-most extent of a loose cluster of log home manufacturers spread along about 80 miles of the Seeley-Swan Valley.

Third, very early on the Bitterroot Valley log home manufacturers generated variety in the types of producers, nominally including machined and handcrafted producers, and this set the stage for later specialization and niche-finding.

Fourth, the marketing practice of maintaining direct (though non-obligatory) linkages between distant building contractors and log home manufacturers that is strongest in hand crafters of the Bitterroot may have been present in handcrafters, having diffused from Alpine into the budding community of crafters.

Finally, it may be argued that the Alpine family tree was characterized by norms and methods that reflect qualitative advantages that served the cluster well. This early core of handcrafters appears to have been both highly competitive and inclined to clustering. In general, my interviews fail to support the idea that the devolution of Alpine was driven by a division of labor and inter-firm contracting practices. What seems certain is that the growth of Alpine's family tree involved rivalry but not rancor. An understanding that hand crafters would be better off as neighbors rather than alone is a consistent theme among informants with Alpine roots. Thus, while there is not agreement about the precise benefits of proximity (these informants gave different answers to questions about this, but all gave detailed and thoughtful answers), the area industry appears to have been infected early on with the idea that clustering helps them.

Contracting was not wholly absent among these firms, but it does not appear as a structural motive for firm fission. In those few cases where contracting appears to have been an early feature of firm formation, it seems to have been as much a matter of personal as economic relations. What appears to be more significant is the early hand

crafters in the Bitterroot area saw themselves as building a community of crafters.

Building the area industry was part and parcel of the entrepreneurial idea.

So far, the discussion has focused on two main developmental moments: the first covering the initial formation and location of two core players in the Bitterroot Valley, and the second entailing the proliferation of firms that took the valley from a point of two isolated specialists to a cluster of log home manufacturers. Up to this time (about 1980), development of ancillary goods and services providers appears to have been minimal, and there was skepticism of it from existing institutions in the nearby city of Missoula. This remark from an early handcrafter is exemplary:

The industry got no respect from the banks. They treated us like we were a bunch of bandits out here in the woods, and to some extent, they were right. We had some pretty wild, woolly characters running the business. It wasn't nearly as credible a business, with standard equity in companies. That changed as the area made a name for itself as a significant, high quality producer and we learned how to be serious managers.

Note that, thus far, the major source of new establishments is from what I have called firm fission. In only one instance (Rocky Mountain) have I identified the emergence of a firm from an outright sale by one manufacturer to a consortium of investors. In both that case and the settlement of Alpine in the valley, the location decision can be described in terms of the classical input-output calculus of Weber. Firms in the first moment of cluster formation (location by a few key firms) only conform to Weber. Firms in the second moment of cluster development (firm proliferation) simply saw the wisdom of the area, which included its input-output cost advantages but went

well beyond these advantages. That decision also (and increasingly) reflected an awareness of the localization advantages generated by the community of producers itself. The area industry noticed itself developing and so did other industries and institutions. By the end of the second period, the cluster began to gain credibility as both a client and market in the eyes of builders, producers, and banks and was noted by wood products analysts at the University of Montana.

The third moment of location (thickening) includes firms that were established in the Bitterroot Valley through the early 1980s. In this third period, increasing acceptance of log home manufacturing as an industry can be observed. The area emerges as a market by both input suppliers and output markets, and the industry “thickens,” adding local capacity in goods and services dedicated to serving log home manufacturers and consumers. We observe more locations by outside investors and the local development of ancillary producers. The cluster gains momentum and recognition as a center for log home production. Weber’s calculus of location becomes more clearly discernible in the comments from informants whose firms were established in this period, but attributes of the cluster itself are central to the attractiveness of the area.

Among the firms attracted to the Bitterroot Valley was Garland, a Michigan company that in 1979 created a branch facility in the thick of the Hamilton log home industry. The parent firm, a machined producer of log homes, went out of business and in 1984 sold its Bitterroot outpost to the local manager (Jon Sellers) as an independent business. This firm has a niche in working large diameter logs, both latheing them and doing complex cuts (i.e., its machinery can cut multiple compound angles in logs). It



produces log homes, in its own right, and maintains its markets in the Midwest, which provide an additional niche advantage. Remarkable here is that the firm has always operated both as contractor and producer.

Another example is GluLam, which was established in the area in 1985. This firm manufactures faux logs by laminating and remilling lumber. The product approximates the look of logs while eliminating some of their drawbacks, such as settling, cracking, insect infestation, and the need for chinking. GluLam's product line includes a faux log siding, which is simply nailed to a flat sheet. This is sometimes purchased by log home builders to cover foundations and garages in log home projects. Sales and contracting to local log home producers is a secondary market. Most sales are as materials sold through regional and national lumber outlets.

Third, in 1989, Montana-Idaho Log Homes was established as a production branch of a Sun Valley design firm. Montana-Idaho is a significant producer of handcrafted log homes, and is largely autonomous from its parent design firm. As noted earlier in this chapter, the firm has found it unworkable to obligate the subsidiary to produce for the parent firm. The internal market of the parent firm is insufficient and too discontinuous to make production through the subsidiary workable, precisely as described by Scott and Storper (1987).

All of these cases suggest that, in this stage of development, outside investors played a significant role in the expansion of the local industry. In addition to this are reports from prior existing manufacturers of getting infusions of capital from passive

outside investors, the equity structure noted in a quote above. It appears that these investments were attracted while new business formations through firm fission continued.

In this period, also, a broader complex of firms developed (see fig 4.1). On the input side is a diffuse set of loggers, house log brokers/distributors, and specialty mills. In supporting services are designers, architects, and engineers, as well as general services (i.e., finance, insurance, and accounting). Related goods providers include log shell assembly contractors, chinking and coating firms, specialty cabinet and door makers, windows, and post and pole manufacturers (which produce railing, decks, and other components). Area machine shops fabricate parts and equipment, and produce reinforcing plates for rafters and such. Recently, a fledgling furniture industry has emerged alongside the log home industry, and a few log home and post and pole manufacturers have diversified into that, piggybacking on the style and market for log homes. Log home manufacturers rely on distant markets, so the complex should be thought to include a network of trucking, assembly, and marketing contacts outside the immediate area.

Ancillary goods and services – such as rails and porches, doors and cabinets, windows, masonry, or chinking – are typically exported directly, not embodied in the log home sales. Design is the most frequent exception to this. The practice of referring home buyers and contractors to affiliated producers, rather than subcontracting a more complete package, is consistent with the usual practice in the United States residential construction industry. Home buyers tend to work principally through contractors at the destination. Many producers I spoke with had experimented with embodying finished

goods in the sale of homes, but did not do it routinely. The logic was that log homes are high-end building alternatives. Affluent home buyers, especially, prefer to maximize their options for customization.

I spoke with two ancillary producers that were formed in this period. One is Specialty Wood Products, a producer of cabinets, doors, and other millwork, specifically designed for log homes. This cabinet shop existed before, but developed a niche in designing goods for log buildings as the area industry matured. My informants suggest that contracting directly with local log home manufacturers was instrumental in establishing this shop as a niche producer of products designed for log homes. Direct contracting, however, is not now a major part of this firm's business.

The other is Weatherall, the earliest of two firms in the area to specialize in chinking and finishes for log homes. This establishment operates as the western distributor of a national producer. My interviews indicate that its manager progressed from contract shell assembly to this distributorship at the urging of friends within the area log home industry. In this case, too, direct contracting with area log home manufacturers appeared to be important to getting the firm going as a successful venture, but does not appear to be significant today.

While designers, chinkers, and cabinet makers report getting their start on the strength of referrals from, and direct sales to, log homes exporters, most such producers flourish or flounder on the strength of their own outside market development.

Skilled workers are plentiful in the Bitterroot Valley. The ready availability of skilled log workers was commonly cited as a location advantage by informants in the

Bitterroot Valley. One informant noted, for instance, that he had not needed to train a wholly new worker for a long time. Two effects appear to be at work in the development of a workforce advantage in the Bitterroot Valley. First is the development by firms of methods of training log crafters and advancing them into a position of crew chief. Within firms, there appears to be a progression of skill and supervision. Between firms, too, a rough hierarchy of occupations was reported, and this crossed lines between machined and handcrafted sides of the industry. In general, the simplest (and lowest paying) jobs appear to be basic milling work for the machined log home producers, and the most complex (and remunerative) ones were in crew chief for handcrafting operations. Second is the attraction of workers from other areas. Industry wages reported in the Bitterroot Valley were substantially higher than those reported elsewhere.<sup>42</sup>

The notion of "industrial atmosphere" includes norms, skills, knowledge, and information advantages that take on the character of public goods. One interesting bit of evidence concerns the assurance of confidentiality that came early in all of my interviews. This assurance to firms in the Bitterroot Valley was commonly met with a shrug and statement that "there are no secrets here." Without exception, firms called local competition more "friendly" than "fierce." Keeping good relations with area competitors was seen as a business practice essential for getting information and favors. It should be noted, however, that the friendly norms of interaction was not universal. Rivalries and competitiveness among firms were evident. Secrets were guarded,

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<sup>42</sup> Handcraft log home producers outside the Bitterroot Valley reported wages in the \$9 to \$12 per hour range, compared to \$13 to \$13.75 within the Valley.

sometimes about methods of production, usually about sources of timber. At least one start-up handcraft operation had “staged a raid” on others for skilled workers.

I was surprised to find that most informants saw privacy as ineffective or unnecessary in the area of job bidding. Certainly, competing bidders would guard their bid prices, but the main issues differentiating firms concerned matters of buyer preference and firm situation before price (machined or handcrafted, style of log joinery, log size and species, green or standing dead logs, timing of delivery, and need for design and on-site assembly services). Further limiting competition were conditions within the firm such as the availability of logs and time. My informants in the Bitterroot Valley had confidence that their location served them well for market development. Buyers can get whatever log home package they want in the Bitterroot, and sellers can help them get it.

Do districts grow in positive external conditions and *develop* in negative ones?

Hubert Schmitz (1995) has proposed that clustering improves the capacity of firms to respond to disruptive circumstances. This section summarizes findings about this proposition. Difficult conditions faced by log home manufacturers in recent years are at least threefold.

1. Demand reductions and cycles embodied in reduced growth of Alpine amenity markets (negative external economies of regional demand).
2. Emergence of diffuse small log home producers around the West, entailing increasing competition from local markets (centrifugal forces brought about by the diffusion of handcrafting techniques).

3. Log supply reductions, driven by exhaustion of nearby stocks of standing dead house logs and rising competition for house logs (negative pecuniary economies in supply markets).

Scholarship on the “rural rebound” suggests that the construction boom conditions of the 1970s slowed dramatically between about 1980 and 1990. In this period, too, hand craft log home manufacturers began to spring up in diffuse locations. Hence, the first two of the above shocks amount to a squeeze between declines in core markets and the growth of diffuse competition. Bitterroot Valley informants whose history spans these years generally confirmed cyclical demand and competitive pressures. They also spoke of this decade in terms of the development of management and strategic skills among Bitterroot Valley log home manufacturers.

Assessing changes in products and market locations is one means of observing district response to these threats. My informants reported a variety of tactical changes. Chief among them is the capacity to undertake large jobs, including commercial buildings, large lodges, and complexes of buildings. The capacity to compete for large-scale jobs was common to many Bitterroot Valley informants, but was not observed outside the area. The ability to do large jobs reflected three competitive advantages: the capacity of these firms to organize design and production functions at scale; the history of working relations (and more rarely, subsidiary ties) with building contractors around the Rocky Mountain West; and the capacity of these producers to assure the price and supply of enough logs of specified size, species, quality, and price in the face of a tightening supply market. Of these issues, the last may be most significant. Logs represent a third

to half of bid costs. The ability to find and finance the needed logs appears to define firms' ability to bid on major projects.

The district also appears to have developed more geographically diffuse markets. In the 1980s, several firms developed export markets in Japan and began to expand domestic markets to the Midwest, Pacific Coast, and Texas. Doing so required experimentation with methods of market representation, such as agents, sales offices, advertising. Such experimentation was common to all growth oriented log home manufacturers, both within and outside of the Bitterroot Valley.

A different type of response to shocks common among manufacturers that were less oriented to growth was to structure the firm to flex up and down in size. This entailed operating with minimum debt and limiting investments in machinery. Informants reporting this tactic suggested that, in difficult times, the firm could be reduced to a skeleton crew and still remain viable.

Finally, the district developed new products and designs. The development of post and beam construction, the incorporation in log home design of stucco-finished building panels, the use of canted logs, dovetail joinery, and added focus on log detailing (interior and exterior log work) and other specialties reflects the general search by firms for products to both differentiate and expand the scope of the business. The orientation toward, and knowledge of, specialized product niches were more pronounced among Bitterroot Valley log home manufacturers.

The other major shock concerns logs. Between the mid 1970s and the 1990s, the cost of standing dead house logs increased from nearly gratis to more than double the

cost of green saw logs, a condition that reflects both increased demand for house logs and diminished supply. Recall that house logs are a premium material. Straight logs with minimum taper and no rot are needed. The majority of log home manufacturers in the Bitterroot Valley reported a preference for standing dead logs because of their better dimensional stability, reduced shrinkage, and environmental compatibility.

Firm owners and managers consistently reported log supply as their most crucial problem, and competition and secrecy among log home manufacturers was at its highest where log purchasing was concerned. None of my informants reported firm failures due to lack of log supply, though nearly all spoke of supply as essential to their ability to compete for jobs, especially larger jobs. Log acquisition also appeared to be a vital strategic issue in firm expansion. In fact, one firm (outside the district) reported having a work stoppage due to inability to find logs needed to complete a home shell. Firms' ability to compete for contracts, especially large ones, is largely predicated on their confidence in a reliable supply of logs. Some Hamilton area firms have been aggressive in bidding premium prices for house logs. For some, getting wood of a certain quality, species, girth, or length is a specialty.

All Bitterroot Valley firms interviewed, and most outside it, reported careful management of log sources. Small and medium sized firms generally purchase their logs, and the larger of these have staff dedicated to log buying. Among the channels reported were loggers, lumber mills, private forest owners, and log brokers. Relationships with loggers and forest owners are guarded "like a good fishing hole." Smaller producers



reported taking great care to maintain excellent relations with their sources (often small, independent loggers), paying them well and upon delivery.

Several larger firms report that they have integrated backward into forestry management, and have significant operations in forestry. They also report ranging farther afield to purchase house logs (reports include the addition of log sources in British Columbia, Alberta, Idaho, and Washington).

House log brokers have emerged in recent years as an input supply specialty, and several such brokers are identifiable in the Hamilton area. Interestingly, the Bitterroot Valley firms I interviewed reported purchasing from log brokers only rarely and as a last resort. In fact, Hamilton area informants suggested that brokers export most of their logs, and thought of this supply specialty as a centrifugal force on the district. Only two firms (neither in the Bitterroot Valley) reported using log brokers as a principal source of supply, and both these firms reported reliability of supply as an outright threat to their survival.

There are other distinctions as well between firms in the district and those outside of it. Manufacturers outside the Bitterroot Valley more often report using green house logs, relying more for timber on nearby forests, and competing more on the basis of lower costs. Within the district, the approaches were diverse but most conform to three themes: ranging farther to find logs; investing more in supply management; and maintaining preferred status with suppliers of premium logs.

In summary, there is a striking variety of approaches in response to the shocks identified. We must be cautious not to conclude that any given approach springs from the

district. Increasing market reach was, for instance, common to all growth-oriented firms interviewed. But I do observe some features that were common within the district but not outside it. Among those were the specialization in large commercial contracts, made possible by advantages in the organization of production and historic links to building contractors. Another was the capacity to both compete for and finance a reliable supply of high quality logs. This took a number of forms, including backward integration, developing distant input markets, and maintaining preferred status with suppliers.

Firms outside districts do not lack resourcefulness. I found examples of highly capable firms outside the district, and examples of contented, lifestyle oriented firms within it. The simple point is that adapting to shocks may be less perilous within districts, in part because tactical information is more easily gotten. Moreover, changes in practices resulting from these shocks appears to have reinforced some modes of operation that set apart the firms in the Bitterroot Valley.

The findings are consistent with Schmitz (adapting to disruptive circumstances), GREMI (restructuring in innovative milieu), and Storper (development of technological intelligence and path dependence). Evidence on this question is not conclusive, but is consistent with previous support for the GREMI interpretation of district development and functioning. What role collective efficiencies played in district development and adaptive response remains to be considered.

### **Mechanisms of district development**

Let us consider how the evidence presented compares with prior expectations. Evidence presented above discounts the transactional account of district formation to the

extent that it suggests new clusters arise from contracting out work that had been done internally. Another aspect of the transactional thesis, concerning the unmanageability of internal control, is confirmed. In this case, however, the unmanageability is not driven only by exogenous changes in markets or technology, as Scott and Storper described them, but also by the artisanal nature of the industry itself. Craft labor is hard to internalize, particularly when coupled with low barriers to entry for new firms.

The jury is out on another major expectation, that clusters emerge first and only later develop attributes of a district. The contrast between the Swan and Bitterroot valleys is, however, informative, because the basic mechanism of clustering is the same between places yet the development outcomes are very different. The above observations suggest that cluster and district formation are not distinct and ordered processes, as Rosenfeld maintains. What appears to have happened in the Bitterroot Valley was a nexus of firm proliferation, technical innovation, and variety, all of which were underpinned by a managerial approach that nurtured the cluster as a community of craft. In short, key entrepreneurs viewed having smart competitors for neighbors as more to their advantage than not. This is most consistent with the innovative milieu account of district behavior propounded by the GREMI school of Crevoisier and others.

I note three factors in firm fission and the development of new local firms: rivalry, divergent goals, and vertical specialization. Rivalry is marked by the struggle between firms for common (input and output) markets. Divergent goals are identified in different orientations to growth and risk taking. Vertical specialization is characterized by opportunities for specialization and divisions of labor and a clear hierarchy in

contracting relations. Instances of vertical specialization are often marked, in this case, by aid given to the new firm, and is observed in pointing out opportunities and generating early contracts by referring and subcontracting. Examples of this last factor appear more common in later stages of district formation.

Let us also take stock of how the evidence accords with the sequence of location, externalization, and agglomeration. First is *location*. By 1973 two firms had located in the Bitterroot Valley whose subsequent expansion and fission largely account for the development of this manufacturing cluster. In little more than a decade, the locational advantages of the Bitterroot appear to have become increasingly intertwined with exogenous benefits of the cluster itself. By the mid-1980s, the log home industry of the Bitterroot Valley had begun to exert market gravity that attracted a variety of producers, purchasers, suppliers, and service providers. These things alone are sufficient to support the idea that a functioning district had developed.

*Externalization* processes refer specifically to general conditions that foster the general growth of log home manufacturing, which includes pecuniary, market, and technological factors. Pecuniary economies were reported under the rubric of standing dead timber, a cheap and plentiful resource that appears not to have been utilized by other industries. Market growth may be observed in the first counterurban boom of the 1970s. In this period, Alpine amenity communities were booming, generating demand for custom construction of high end homes. Technological economies can be observed in the development of means of production (and its organization) that were easily replicated by

other firms. This is evident in the fabrication of log latheing equipment and in techniques of log stacking that permitted the revival and industrialization of log building by hand.

*Agglomeration* economies refer specifically to development dynamics that are internal to the district itself. Exogenous economies refer to features of the cluster whose emergence benefits all firms within the district, such as labor organization, the thickening of subsidiary trades, transportation and infrastructure, and “industrial atmosphere.”

Infrastructure and formal institutions, remarkably limited in this case (this will be examined later). Three exogenous features stand out. One is the thickening of the industry in the Bitterroot Valley, which has been described. Second is the development of an advantageous labor market. Third is the industrial atmosphere of the area.

Collective efficiencies are another type of agglomeration economies, marked by joint action and the sharing of fixed costs in the form of social divisions of labor, cooperation, alliance, and institutions. Because collective efficiencies are such a central focus, this topic is covered in the concluding section.

By the early to mid 1980s, district functions had emerged in a cluster of log home manufacturers in the Bitterroot Valley. The area had become attractive as an industrial location for labor, purchasers, suppliers, service providers, ancillary producers, and kindred producers. This attractiveness went well beyond elements of the Weberian input-output location factors. Investors and purchasers were not coming to the Bitterroot Valley only (or even mainly) because of favorable input and output conditions, but because *the industry had demonstrated local vitality*. These things demonstrate district function and further promote localized advantages of the district.

***Collaborative efficiencies and joint action***

In recent district studies, agglomeration effects have been conceived in terms of social divisions of labor and observed in production chains that both reflect and advance the local specialization of firms (Storper 1997). The case of the log home manufacturers of western Montana is intriguing and problematic because extensive local production chains are uncommon and quite limited when they are observed. Most log home manufacturers complete a very similar step of production: they purchase logs and produce log building shells for shipment to residential and commercial construction sites. Rails, stairs, and porches only are sometimes contracted and embodied in the contract. Design, shipping, and final assembly of the building shell are often embodied in the product (always, when necessary). Most other ancillary construction goods and services, however, are arranged by the building contractor, as is the general practice in the construction industry. The possibilities for production chaining in the log home industry appear to be quite limited.

What distinguishes collaborative efficiencies from other district effects is the absence of an invisible hand. Collective action and collaborative efficiencies entail conscious, non-obligatory action, the benefits of which can be direct (as in the case of contracting) or indirect (district building behavior). Such action reflects and reinforces norms of conduct that become embedded in local relationships.

I describe evidence of collective action in four main parts. First, the normal scope of the log home firm is described in greater detail, and I consider what goods and services are routinely purchased by log home manufacturers. Second, I examine instances of aid

given by log home manufacturers in the development of new firms. Such aid effectively increases the scope of local production. Third, I describe practices of contracting and exchange among log home manufacturers and explore the inter-firm relations that underpin them. Fourth, I describe the (modest) role of formal institutions. I conclude the section with a discussion of the form and function of inter-firm practices in the district as those relate to prior expectations.

### **Production scope and vertical contracting**

In describing what is produced within the firm and what is contracted, I must generalize. Actual tabulation of these findings is difficult because of differentiation among informants, the small sample size, and the intensive and progressive nature of the interviews. It appears that firm size is the primary discriminating variable.

The typical small firm has between one and three crews, pays a peeler on piece rates,<sup>43</sup> and has an in-house marketing and management function. Logs are acquired by the typical small log home manufacturer through working relationships with small loggers, mills, and forest owners. Contracted goods and services embodied in the log home include stairs and rails, design and engineering, equipment fabrication and repair, and final assembly. These contracted elements are not part of every job, but are arranged by the manufacturer as needed by the purchaser.

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<sup>43</sup> In hand crafting firms, most crews are composed of three laborers. Crew organization is less common in machined log home manufacturers; in those cases, labor is divided by specialized tasks. It is standard practice among nearly all informants to pay peelers on a piece-rate basis. Even machine manufacturers of log homes report using peelers, whose work follows machining stage of processing and is done to give lathed logs or milled cants a hand finished look.

The typical medium-sized firm includes more internal log buying capacity. Internal marketing and design functions, too, are more extensive. Other contracted elements are similar, although exceptions are common. A firm may, for instance, have a person with particular expertise in machinery, or prefer to use its own crews to do final assembly when necessary.

The largest firms report extensive internal investments in management of log supplies, including forestry departments that purchase timber land and sales, international subsidiaries, and strategic relationships for logs with other major buyers (e.g., large mills). These firms tend also to invest more heavily in marketing and design. The offices of such firms often include a showroom that is geared toward consumers who travel to the area to shop for log homes. Such firms also tend to build up their design capacity to include architects and designers on staff and invest in computer aided design.<sup>44</sup>

These observations suggest that, as log home manufacturers grow, they tend to thicken, professionalize, and internalize functions of log buying, design, and marketing. In the process, they also appear to develop a particular niche (e.g., a certain size of logs, location of market, etc.) and add innovative capacity (e.g., very large commercial projects, or major design innovations such as the incorporation of insulated panels and stucco in log and timber design). Special niches appear to supplement, not supplant, firms' more typical markets and product lines. Advantages of larger size appear to be in firms' capacity to manage risks associated with log supply uncertainties and in their

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<sup>44</sup> Computer aided design (CAD) appears more common among log home manufacturers that lathe their logs. In such firms, unlike in hand-worked methods, log home shells are not pre-assembled, but put



capacity to diversify into new products and markets. There may also be scale economies in workforce training and internal division of labor (i.e., specialization).

Certain things are quite similar across the spectrum of firms. The general organization of labor into crews of wage laborers, for instance, is about the same. Decks, rails, and stairs are commonly noted as a common contract element and were subcontracted or referred to others by all log home manufacturers responding. There appear to be only limited economies from standardization in design; all log home manufacturers report that nearly every contract is manufactured to custom specifications. Chinking and finishing are rarely embodied in the contract, and never performed in-house. There is a strong tendency to resist internalizing other finished elements, such as doors, windows, or masonry into the product. Some informants noted that they had experimented with incorporating more finished elements, and avoid doing so. Most log home manufacturers concentrate on production of the log home shell by an in-house labor force, and cater to the high end building consumers who want uniqueness in both home design and finishing.

Two counterexamples, both outside the Bitterroot Valley, help illustrate the normal organization and scope of work among log home manufacturers. One small firm reported total integration of the firm, from logging to finished construction of the home. Another medium-sized firm reported a shift to piece-rate production labor and the contracting of assembly and building to the finished stage of construction. Such practices

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together as kits from design specifications. The need to locate notches and other joinery cuts precisely appears to justify CAD systems at lower volumes of production.

are not different by degrees; these firms are eccentric compared to the general population of log home manufacturers.

Contracting helps explain thickening in the district in such areas as post and pole manufacturers (which produce stairs, rails, and decks), machine shops, log supply channels, shell assembly contractors, and designers. Referrals alone may account for a good share of growth in specialty niches that are not usually contracted by local firms, but another process can be identified: outright aid given by established firms to new ones.

#### **Aided startups in the vertical expansion of the district**

In some specialties, the thickening of the district cannot be accounted for by local direct contracting relationships. Some informants reported purposeful, even altruistic, action on the part of tenured firms to help new specialties get established locally. Such practices represent an intriguing variant of the processes of new firm formation identified above. They represent a type of collaborative efficiencies not identified in the literature.

My interviews found instances in which established firms helped promising individuals go into business by, first, identifying profitable niches, and second, generating early business for them by unusual direct contracting. These reports involved chinking and finishing firms and specialty millwork (i.e., doors, windows, cabinetry for log home design) manufacturers, neither of which are routinely contracted. Reports indicate that these specialties got an early start on the strength of contracts generated for them by area firms, but survived and grew on the strength of their own efforts. A similar process was observed in the formation of firms doing log shell assembly, including one instance very early in the cluster's formation.

In both chinking and millwork, the “aided startup” firms appear to have been the first in the area to engage in these specialties, but they were not the last. In both niches, other firms emerged. Aided startups demonstrated the viability of new local niches, but once the specialty was proven locally, other producers in the district emerged via the typical processes of diffusion. The result was a further deepening and thickening of the log home district. This provides a modest illustration of the cumulative nature of location, externalization, and agglomeration in district development.

The absence of direct contracting benefits from aid to some startups indicates the promotion of indirect benefits, or district-building norms. It reinforces the conclusion that, to some degree (perhaps a large degree), the Bitterroot Valley log home district was built by the purposeful efforts of a community of entrepreneurs and was not merely a product of external and market forces.

#### Exchange and contracting among log home manufacturers

I asked all log home manufacturers interviewed to describe contracting and exchange with other log home manufacturers, and this was the single most intriguing and lengthy segment of most interviews. Commonly, informants began by emphasizing that they did *not* routinely contract with other log home manufacturers. With that qualification, informants described a wide variety of exchange relationships among peer firms. I took the reports to indicate practices that are not routine in the typical job, but are more or less common aspects of relations with peer firms.

Within the Bitterroot Valley district, exchange relationships appear to be richer, to involve more and larger firms, and to be more faceted than outside the district, but the

general themes of the reports were kindred regardless of location in or outside the district. These interviews also identified firms that do not play by these rules. Among them, it appears, are firms that had a significant role in forming the Bitterroot Valley log home district.<sup>45</sup> In the paragraphs that follow, I outline types of exchange relationships observed among peer manufacturers.

**Information: market and product knowledge.** Information was the most often noted area of exchange. I have previously noted that most informants shrugged off assurances of confidentiality because “there are no secrets here,” but in fact there are some secrets. Informants were often guarded about such matters as log sources, qualities of logs on the lot (such as size, species, condition, even though these were stored in plain view), and precise descriptions of some production methods. Surprising to me was that producers reported that information about downstream markets appeared quite transparent, including jobs being bid, market conditions, product lines and elements being offered to buyers, and relationships with distant builders.

Pricing information is not shared during the bidding process, and never among direct competitors, but much information about bidding and downstream competition seems to be diffused through circles of peers with whom informants keep friendly

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<sup>45</sup> Although confidentiality guidelines prohibit researchers from “naming names,” there are none to name here. My informants were reluctant to identify the others that were most hostile to the types of collaboration and exchange outlined here. From the responses, I conclude that some small set of well established, larger firms (perhaps one firm) simply did not welcome the types of open relations that were commonly reported in the district as a whole. This is interesting because it suggests that at least one firm instrumental in forming and promoting the district holds itself apart from collaborative norms that have developed since.

relations. By these means, respondents in the Bitterroot Valley appear to keep abreast of the range of skills as well as the busyness of peer producers.

Information flows benefit firms in the district in two obvious ways. Most generally, knowledge of innovations in design and production capacity reaches firms in the district quickly, through close and casual channels and improves firms ability to respond to competitive shifts. Crevoisier elegantly expressed the knowledge economies of localization: information flows in proximity are free, fast, and multiplex (1996). More particularly, knowledge of local capacities reduces head-to-head competition on price alone. Respondents reported that there is bid competition for jobs, but prior to that are buyers' decisions about what they want.<sup>46</sup> Firms refer through peer circles to match buyers to producers. These processes of decision and referral delimit a small field for competitive bidding. They also raise the awareness of smaller firms about the need to enhance their scope of offerings, whether by adding internal capacity or contracting.

**Logs: reciprocal relations and growth management.** Given competition and secrecy reported over log sources, it was somewhat surprising that informants reported trading in logs more often than any other good or service (information aside). Informants commonly noted that they look to other log home manufacturers for logs on occasion. Providing logs to peer firms when possible is a means of "staying on the good side" with

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<sup>46</sup> The purchase decision by log home buyers can be mapped on a decision tree that includes questions such as: How big? When? Do you have a final design? Is there a log preference (e.g., species, size, green/standing dead)? Stacked logs or post-and-beam? Machined or hand crafted? Lathed or canted? Swedish coped or chink-gap style? Saddle notch or dovetail joinery? This general decision tree is mirrored by producers, who ask: Do we have the logs? The time? The capacity to produce what is wanted? Who does?

neighboring firms; informants' comments invoked reciprocity and the advantages of being able to turn for help to others in the district.

Most instances of log trading appear to involve helping other producers through a difficult spot, by providing a few needed logs or a log of certain dimension/quality for a particular use. In at least one instance, however, supplying logs to smaller buyers was reported as part of a growth strategy. One expanding firm had invested heavily in developing new, distant sources of supply as a necessary step in firm expansion. Having logs available enabled the firm to bid for more jobs. In the meantime the surplus logs were dealt locally to other log home manufacturers in the district.

**Jobs: referral, specialization, contracting, and hierarchy.** Referring and contracting jobs to peer log home manufacturers appears to be a common aspect of inter-firm relations. The major variant of this was to simply link a prospective buyer to a capable firm, either because the referring firm was busy or because it did not have some capacity needed by the buyer. The practice of referral, like traffic in logs, appears to build a stock of reciprocal relations among firms and to maximize the jobs secured within a peer circle or district.

In another variant, firms subcontract for certain specialized components of a contract. Exchange of this type highlights those firms with certain specialties, such as working logs or large diameter logs, or the ability to cut multiple compound angles for accent elements. Practices of contracting for log accent elements increase the scope of product offerings in the district.

The third variant entails contracting for production of the whole log home shell. I asked why firms contract in some cases and refer in others, and the answers point to hierarchies among peer circles. In some instances informants reported an uneven reciprocity. They refer jobs to firms from whom they often contract, and they supply logs at cost that are reciprocated at a mark-up. Interestingly, the hierarchical relations underpinning instances of unequal exchange do not seem to reflect different tenure or skill, but the consideration by “satisfied” firms of investments by more growth-oriented peers. For instance, one midsized machined log home manufacturer had developed a market in the Midwest and contracting handcrafted jobs enabled the contractor to expand the scope of product offerings by acting as a merchandizing (i.e., pass-through) contractor. By taking a subordinate position, the subcontractor honored the distant market relationship, while effectively increasing its own reach.

In instances of direct contracting observed, the subcontractor was typically a well established firm of high skill and long tenure. Hence, the contracting did not appear to be a variation of aided startup practices described earlier. Informants spoke of the high need to be able to trust the subcontractor for quality and delivery.<sup>47</sup> The symbiotic aspect of the relationship appears to involve firms’ *different growth orientations*. In essence, the satisfied firm (“laggard,” in Taylor and Thrift’s lexicon) played a substantial role by making possible the increased scope and reach of the district through uneven reciprocal

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<sup>47</sup> On this note, the lack of trust in the quality of ancillary producers was consistently cited as a reason log home manufacturers did not engage in more contracting for embodied elements such as doors, decks, etc. Log home manufacturers did not want to be left “holding the bag” when delivered goods reached the construction in unacceptable condition.

relationships. Some such “satisfied” firms were repeatedly identified as part of other informants’ peer circles.

This is one of the most intriguing and unexpected findings of this case: Laggards are not underskilled and in district conditions may make possible contracting practices that would not otherwise be workable. The importance of innovators and growth-oriented firms is obvious and well noted in the literature. What is new here is the possibility that some proprietors are trusted and skilled, but *satisfied* with their small size and modest growth, may be the glue that makes some reciprocal contracting relations stick.

**Equipment and labor exchange: stabilization and experimentation among some small firms.** Exchange of labor and equipment has been noted in some cases in the literature, and is a potential source of flexibility. Also, some analysts have proposed that the flow of workers among firms could be a means of transferring knowledge between them. Exchanges of labor and equipment were rarely reported by informants. In fact, the tenor of most reports involved concern about guarding skilled laborers and working to keep them busy year-round in order to protect the firms’ investment in training and knowledge of log building techniques. There are two types of exceptions. First, a few of the smallest log home manufacturers reported employing each others’ workers to help them avoid layoffs and lost labor capacity. Second, some smaller firms reported lending piece-rate peeler labor under the rationale that peelers have different rates of production than log builders. In no reports did such labor and equipment exchanges appear to be routine practice, rather, they were exceptional and situational. At most, these reports



appear to reflect experimentation among circles of small firms to find workable modes of exchange.

### Formal institutions

Formal institutions were remarkably weak in this case. Most log home manufacturers in the Bitterroot Valley were quite skeptical of, and reluctant to get involved in, formal institutions representing the log home industry. Some reported activity in various national groups, including log home building associations and local commerce groups, but none invested much faith or time in them. In no case did the interviews reveal institutions that had a local basis or any special orientation toward this district. Institutions identified included national associations, log certification services, and a distant school for log handcrafting. Although some of my informants reported having hired workers that had been trained at the log school, none reported more than passive involvement in any of the institutions. Typical comments were "I'm not a joiner," "I'm too busy for that," or "That just helps inferior firms get credibility."

Among the formal institutions identified were national log home builders associations. These were generally active in industry promotion and marketing, and some respondents reported actively working to place reviews of their work in trade magazines that are promotional arms of some building associations. Another function of the national associations was to address regulatory barriers, particularly in the form of challenges to the energy inefficiency of log homes. The main problem is that the most common methods of energy rating (R-ratings) tend to privilege insulating qualities of fluff (e.g., fiberglass wool) over mass (e.g., logs). In response to this problem, some log

home manufacturers developed methods of hollowing the log and filling the cavity with insulation; one such firm in Montana was among the earliest log home manufacturers, but is now defunct. The dominant response to this potential crisis stems from scholarship on the measurement of insulating qualities of log mass. Log home associations have challenged regulations on a state-by-state basis to integrate into building codes alternative energy rating methods that account for energy retaining qualities of mass. My informants acknowledged the importance of this work, and some supported it through membership dues, but none reported involvement beyond this.

Another type of institution developed to provide certification of log quality for house logs. This institution involves a roving log inspector who, for a fee, examines logs for rot and other qualities. My informants were mixed on the value of this service, with some being decidedly antagonistic toward it. Some informants used this service. Many viewed it as “lowering the bar” and protecting inferior producers. In general, it appears that the institution does reduce a barrier to entry in the log home industry and is more often used by newer firms and more regularly scorned by long established ones.

These findings speak to interpretations of collective action that highlight the role of formal institutions. Researchers following Italian examples, for instance, proposed formal institutions as the major policy tools of district development.

#### **Peer circles and the mode of collaboration**

Firms in this cluster do find it efficient to collaborate. All but a few largest and most isolated firms interviewed routinely exchange information. They look to each other as a safety stock of logs and treat requests for logs as an investment in good relations.

They report routinely passing along surplus demand to one another, either by contracting or referral. A few have experimented with reciprocal trade of workers and equipment.

It is important to note that firms engage in such practices selectively and that they reciprocate differently. Nearly all those interviewed identified a circle of confidants and collaborators, and described common types of interaction with them, but the nature of collaboration differed significantly from one informant to the next. Moreover, when interviews were conducted within a circle of peers reported by one firm, those peers invariably reported a somewhat different peer group and relations.

As the interviews progressed, I added *circles* to my thinking about district phenomena. I mean that term to refer to a firm's peers, with whom relations are relatively open and reciprocal, as opposed to guarded and competitive. I do not mean to imply that these circles are formal and closed, but quite the opposite. They appear to have more the character of friendships, rather than business arrangements that constitute zones of safety in which information and favors may be exchanged within a local context of competition and rivalry.

Not only do the circles in this case appear to be fluid and highly personal, but since one firm's circle intersects only partially with another's, they also tend to interlock. I began to imagine formative districts as a tapestry in which friendship is the weft and rivalry the warp. What appeared (when viewed as an industrial system) as a chaotic mélange of reports began to make sense when viewed as a community system of interlocking social relations, through which capacities are developed, norms imposed, and information diffused.

It seems reasonable to suggest that the presence and pervasiveness of circles plays an important role in the development of new districts. Through the multiple circles that constitute an industry cluster, information is conveyed, factors are exchanged, and specialized product and market niches develop. Such outcomes appear to improve firms' ability to thrive in volatile conditions, and they permit higher risk taking than might be seen in more isolated settings.

I do not mean to suggest that circles are sufficient to explain district development. Not only were these types of relationships observed outside the district too, but also, some successful players within the district appear to hold themselves apart from these types of relations. In district conditions, the number of circles increases, and, it appears, their function becomes more diverse and the substance of what is transacted becomes richer. Firms working through interlocking circles may more routinely anticipate changes in the external economy, and more readily experiment with adaptive responses. This augments Schmitz's (1995) insight that districts help firms adapt to disruptive circumstances. It is also consistent with Malecki (1997), who points out that firms with an "extroverted personality" can succeed in isolation, but that an information rich (i.e., urban or district) environment helps firms to succeed more routinely.

The general nature of what I have described as circles seems to be understood by the producers themselves. For instance, when asked whether they collaborate or compete with neighboring firms, most respondents reported that they did not, as a rule, collaborate. That brief denial was typically qualified at length by a description of a circle of reciprocal relations. Almost without exception, firms characterized their relationships

with others in the district as "friendly" rather than "fierce." Moreover, most informants scoffed at assurances of interview confidentiality. Although competition does concern these producers, and certain skills and techniques are guarded closely, it is commonly understood that information about products, markets, and management problems passes quite readily among the firms. Such is the nature of districts, that knowledge of the industry is, as Marshall put it, "in the air" (1925).

## **Chapter 5: The Marine Trades District of Port Townsend**

The following case study is based on intensive interviews conducted between 1996 and 1998 with twenty-four informants in the Port Townsend marine trades cluster. As in the preceding case, I initially sought out firms and institutions that were known to have a prominent role in the development and performance of the area industry. These mainly included firms of medium and larger size, and institutions that had substantial role and longevity. The second phase of interviews included smaller, newer, and more diverse firms than were included in the initial selection. The interviews reached a substantial proportion of producers in the core functions of boat building and repair, and several firms engaged in production of ancillary goods and services.

The Port Townsend marine trades cluster is quite different from the prior case. The industrial complex of the boat building industry is much more extensive. While log home manufacturing involves the industrialization of a few relatively simple processes, the marine trades are diverse and their interactions manifold. Hence, while in the prior case, comparisons in and outside of the agglomerated core of log home manufacturers could be readily and profitably made, in the present one, the first imperative was to understand the scope of work done locally, the nature of linkages, and the role of institutions. I did not venture forth from the Port Townsend area, except to explore a major manufacturer that had moved most of its operations out of the area during the course of the research.

The broad scope of, and manifold linkages among, producers within this cluster make it more difficult to tabulate attributes at the firm level, such as scope and scale of production, size, input and output markets, and response to shocks. Many elements of the picture that emerged were, nonetheless, clear and consistent.

The lifestyle attraction to the Port Townsend area of boat builders and others marine trades entrepreneurs appears to be integral to this cluster's formation, and this adds an unexpected twist to the discussion of contemporary spread and counterurban development effects. In the preceding case, cluster formation was observed as a product of regional growth of amenity driven construction markets in the rural west. In the former case, industrial formation in the Bitterroot Valley was a secondary effect of diffuse, counterurban settlement. In the case of Port Townsend, counterurban development appears to be more driven by the lifestyle-driven relocation of boat builders themselves from the metropolitan core to periphery. Here, counterurban effects are primarily evident in the movement to the periphery of the industry itself. Although some instances of labor and cost-driven movement can be identified, the bulk of informants noted lifestyle motives for relocating.

Formal institutions are remarkably strong in this case. The main ones are the Port of Port Townsend, the Northwest School for Wooden Boatbuilding, the Marine Trades Association, the Wooden Boat Foundation. Others have emerged, played a role, and declined over the course of this cluster's development.

Finally, it became apparent early on that this case involved contracting relations that were abundant, fluid, routine, and multidirectional. While the prior case tends to

confirm more to Porter's ideas about regional industrial clusters, the marine trades cluster of Port Townsend has characteristics of the classic Italian districts, in which contracting and institutions rise up as clear peaks from which development can be interpreted.

Some things are common to these cases. Both attracted my attention because of their recent formation, in the middle 1970s. This affords the exploration of contemporary district formation through interviews with a number of founders. Since both study locations are relatively rural, it seemed possible to look to these in search of clues to the future of contemporary rural development. What I had not anticipated or purposefully sought out was craft industries. Both of these cases are clearly characterized by the presence of high skill, craft labor in which firm formation shaped by low costs of entry.

In the following pages, I first present the industry in overview, focusing on data on trends and features of the national industry and the gross character of the local industry. The second section considers cluster formation and district development, in which an historical sequence of development is described as a means of examining the development path of the formative district. Finally, in the third section, I further explore features of the district as they bear on the mechanisms of district formation and function.

### *The industry and setting*

#### **The ship and boat building industry**

There are two main divisions within the water craft manufacturing industry: ships and boats. In federal industry classification systems, ships refer to larger craft intended for commercial usage. Shipbuilding and repairing (NAICS 336611) is further marked by the presence of dry-docks other large-scale equipment. Yachts large enough to require a



professional crew are classified with ships (US Census Bureau 1999). Boats are smaller and intended for recreational use, and in general, boat building (NAICS 3366112) requires equipment on a smaller scale (US Census Bureau 1999). Although ships and boats are usually differentiated by both size and use, the historic focus of production in Port Townsend is on smaller fishing craft.<sup>48</sup>

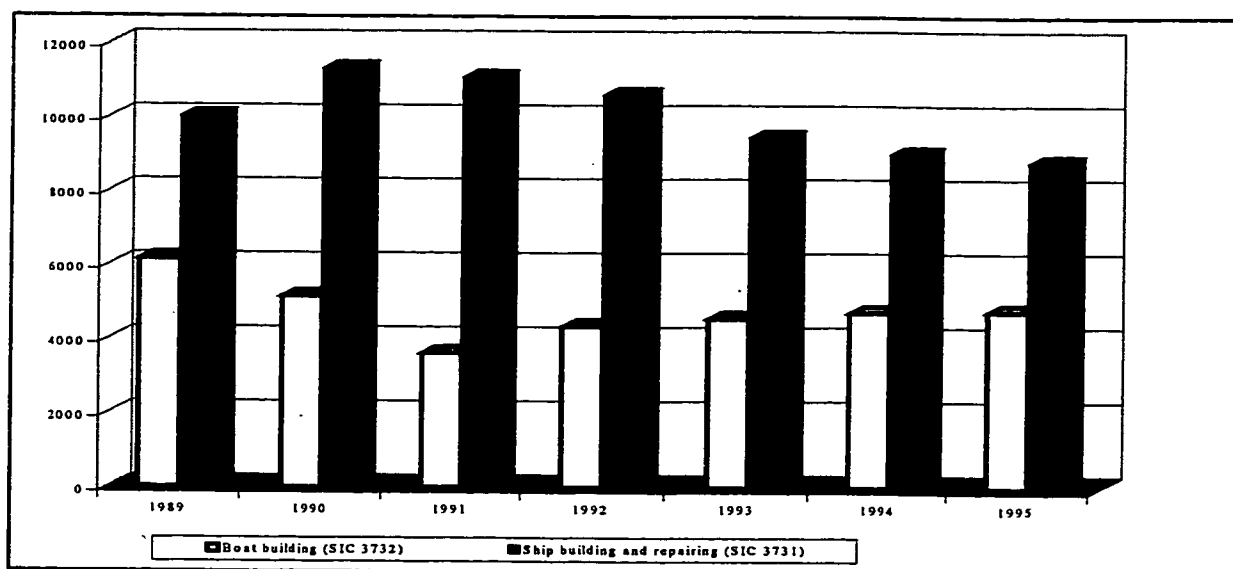
Aside from size and use, at least two other distinctions can be made within the industry as it pertains to this case. One is the division between repair and new boat building. These two activities have distinctive, and in many ways complementary, growth trajectories, and shipwrights in this area commonly work in both realms. Another is the distinction between wooden hulled boats and those made of other materials. In this cluster, the crafts of manufacturing and repairing wooden hulled boats was an early and persistent point of local specialization. Shipwrights that work in fiberglass, aluminum, and steel hulls are also present and growing in this case, and these firms are similarly integrated in the broader industry complex and local cluster.

Recent growth trajectories for aggregated ship and boat building industries are shown in the chart below for the 1989 to 1995 period. These figures (which are aggregated by four digit SIC codes) provide a somewhat longer time horizon than are available using the newer NAICS classification scheme. The chart shows a declining value of shipments in shipbuilding and repairing. After peaking in 1990 at about \$11 billion (in 1993 dollars), shipments declined by more than 20 percent by 1995

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<sup>48</sup> I refer to the ship and boat building industries by their formal statistical designations in this section only. Throughout the remainder of the dissertation, I follow the parlance of my informants and refer to all ship

(Department of Commerce 2000). More detailed figures from the 1997 industrial census suggest that one major division of shipbuilding and repair – new military ships – accounts for all of the decline in the 1992 to 1997 period. This division, which accounted for more than 40 percent of all shipbuilding, declined by 25 percent in nominal dollars in five year period ending in 1997. All other divisions of shipbuilding grew (US Census Bureau 1999). Boat building shows the opposite overall pattern, with production declining from \$60 billion in 1989 to a low in 1991, then rising in real dollars modestly but steadily through 1995 (Department of Commerce 2000).



*Figure 5.1: Value of shipments in US boat and ship building industries (millions of 1992 dollars)*  
(Department of Commerce 2000; Department of Commerce 2000)

and boat builders and repairers as boat builders or shipwrights, and use the term marine trades to refer to the broader local cluster.

Table 5.1: Ship and boat building industries, selected statistics

Industry or industry division	1997 Shipments (000)	Growth 1992-1997 (nominal \$)	Production workers / All workers	Value added / Total production	Production hourly wage	All workers' hourly wage	Mean/ Median size: all-workers
Repair of nonmilitary ships	\$1,082,168	23%	0.81	0.66	\$16.76	\$18.18	-
Military ships, new	\$4,638,092	-23%	0.58	0.61	\$15.74	\$17.68	-
Repair of military ships	\$2,116,001	7%	0.84	0.61	\$15.03	\$17.80	-
Self-propelled ships, nonmilitary	\$953,104	47%	0.87	0.48	\$13.26	\$14.75	-
Not self-prop. ships, nonmilitary	\$878,251	95%	0.87	0.42	\$12.31	\$14.36	-
Shipbuilding and repairing, nsk	\$479,230	20%	-	-	-	-	-
Sailboats (NAICS 3366127)	\$376,515	45%	0.75	0.51	\$11.23	\$12.86	-
All ships (NAICS 336611)	\$10,196,846	-2%	0.74	0.59	\$14.79	\$16.95	138 / 71
All boats (NAICS 336612)	\$5,129,849	N	0.80	0.43	\$10.32	\$12.29	39 / 29

(Sources: US Census Bureau 1999; US Census Bureau 1999)

nsk: not specified by kind

There are five major subcategories of the shipbuilding and repairing industry: non-propelled ships (i.e., barges), military ships, self-propelled ships, military ship repair, and nonmilitary ship repair. Prominent in the Port Townsend cluster are production of new self-propelled ships and nonmilitary ship repair, which account for 32 percent of the total shipped value of \$10.4 billion in NAICS 336611. At \$5.6 billion, the *boat* building industry (NAICS 336612) was about half the size of shipbuilding in 1997 (Table 2.1).

In the Port Townsend area, fishing boats are the largest market for shipbuilding and repair, although repair work on recreational boats is common and growing. New nonmilitary ships (self-propelled) – a category which includes yachts, fishing ships, tugs, and mobile oil drilling platforms, and others – account for 9 percent of all value in ships at \$950 million in 1997. Washington was, in 1997, the third largest nonmilitary ship producer of nonmilitary ships among states, with 7.7 percent of national production. This division had 47 percent nominal growth in shipments nationally, between 1992 and 1997, which was concentrated in the southeastern states of Louisiana, Florida, and Alabama.

Washington's growth was comparable; its share of production changed little over the five year period.

Repair of nonmilitary ships is the largest non-military division of the shipbuilding industry, accounting for over 10 percent of all value in the shipbuilding industry, at \$1.08 billion in 1997. (Interviews from this case suggest that ship repair involves much more than routine maintenance. The lengths to which refitting and rebuilding of commercial ships can go is illustrated by practices observed in this research, in which the hulls of fishing boats were cut in half across the stern so that length could be added in the middle, which often entailed a comprehensive rebuilding of other systems. These and other refitting practices were thought necessary to help smaller fishing boats compete against more massive "factory" fishing ships.) Washington was in 1997 the second largest producer among states in this division, with 13 percent of national production. This division of the industry nominally grew by 23 percent from its 1992 level nationally, with Washington growing at 53 percent.

Twelve coastal states account for nearly 80 percent of all value in ship repair. The west coast states, with California, Oregon, and Washington account for 30 percent of national production. Ship repair in the three west coast states grew by \$61 million, in nominal dollars, between 1992 and 1997. While California declined by \$30 million, Washington's ship repair industry grew by nearly \$50 million between 1992 and 1997, one-quarter all national growth in the sub-industry.

In *boat* production, Washington ranks as the second largest producing state with 7.4 percent of United States production. Oregon accounts for 1.6 percent and ranks ninth.

Fifteen states account for 48 percent of production. The largest center of boat manufacturing is Florida, with 20.4 percent of the industry total. Sailboats and canoes (NAICS 33661271), one of five major subcategories of boat building, is the main subcategory of boats produced in the Port Townsend cluster. As a subcategory, sailboat building grew in value by 48 percent (to \$375 million) between 1992 and 1997. That growth was bipolar by size, being stronger in sailboats smaller than 21 feet (124 percent growth); and those over 39 feet (109 percent growth).

The ratio of value-added to total shipped value is a reasonable measure of the labor and management intensity of production. (The ratio expresses shipped value as a percent of labor costs plus margin.) In these industries, value added ratios are quite closely associated with hourly wages. All shipbuilding and repair had a value-added ratio of 59 percent in 1997. Within the sub-industries, ship repairing had the highest ratio at 66 percent. Nonmilitary self propelled shipbuilding, at 48 percent, had the lowest. Boat building has lower ratios, with 43 percent for all boats, and 51 percent for sailboats.

Establishment size may be taken as a rough gauge of the degree of integration. Census reports do provide some geographic detail in this measure. If smaller firms are the norm in a state that is a significant producer, we may suspect that state's industry tends toward a relatively less integrated form of organization. In both ship and boat building, larger employers are concentrated in the southern states. The average size of establishments in Washington state classified in shipbuilding is 59, compared to 138 nationally; and Washington boat building firms average 28 workers, compared to 39 nationally. These figures suggest that Washington's ship and boat building industry are

more disintegrated than is the national norm, and may be markedly different in its organization from peer industry centers in the southern states.

National industrial statistics can be used to measure the importance of merchandising and contracting within the industries. In all shipbuilding and repair, the cost of materials that are resold without further processing, plus the cost of contract work purchased amounts to 10 percent of the total cost of material inputs. In the boat building industry, that figure is 7.2 percent. (Recent census documents do not provide historical trends in these figures.)

Finally, the ratio of production workers to all workers can be taken as a proxy measure for the importance of technical expertise required within an industry. In industries and industry divisions that have *lower ratios*, we can expect to find *higher levels of customization* in functions such as marketing, design, and engineering, which are consistently (if not exclusively) associated with high technology and flexible specialization accounts of industrial development. Interestingly, only two of the industry divisions listed above stand above the norms of their industries on this technology measure. In shipbuilding, the military ship division has a remarkably low ratio of nonproduction to production workers, at 54 percent. This probably reflects the high technology in weaponry that goes into military crafts, but also may reflect a high degree of customization. In boat building, sailboat manufacturers are, at 75 percent, somewhat below the norm for all boat builders. Both divisions of new nonmilitary shipbuilding (self propelled and not self propelled) have relatively high ratios, at 87 percent.

The foregoing review of national data for these industries supports these conclusions:

- The ship and boat building industries together produce more than \$16 billion in value annually (about one sixth the size of the aerospace industry in the United States). Excepting production of new military ships, all industrial divisions identified have grown over the last several years.
- Regional shifts can be identified from the census data. A shift toward southern states is particularly notable in divisions producing new ships, and larger employers are most evident there. In the coastal west, production moved north between 1992 and 1997, with declines in production in California and increases in Washington and Oregon, and this shift is especially marked in ship repairing divisions. Within Washington, most divisions of the boat and shipbuilding industries have been relatively stable or growing in recent years, but the growth in nonmilitary ship repairing is exceptionally large, with 53 percent nominal growth in the five year period ending in 1997. Nonmilitary ship repairing accounts for the largest share of all non-military shipbuilding.
- Shifts toward Washington are most concentrated in the ship repairing, the industry division with the highest average wages and value-added ratios of all those examined.
- The industry Northwest appears to tend toward a more disintegrated form than is the norm nationally. While Washington has participated in the national growth in the

industry, firm sizes there have not increased. Such a profile is consistent with the expectation of a flexible specialization interpretation of the industry in this state.

This national data supports the overall conclusions that Washington has demonstrated *location* advantages in boat and shipbuilding industries; and that *external economies* of market growth are present. Both these factors have been posited as basic conditions in the development of industry agglomerations.

This data, however, should be viewed with some caution in this case study. Viewed in larger context, the Port Townsend area contains only a small portion of the total ship and boat building industries, even within the state of Washington. We cannot confidently generalize about matters of firm size or organization from the nation to a single small town's industry.

Another source of uncertainty is in the broader marine trades complex. (In the remainder of this case study, I follow the usage of my informants in calling all water craft *boats*, and refer to the cluster as a whole as *marine trades*.) In this case study, and plausibly throughout the industry, the actual building and repairing of hulls constitutes only a fraction of the work. My experience in identifying this cluster via standard industrial statistics suggests that a large number of firms engaged in the marine trades are classified with other industries in most formal censuses. It is plausible that in district conditions, many facets of marine building are categorized in other industries such as machining, hydraulics, engines, wood working, painting, and canvas work, plus services such as marine architecture and surveying.



The finest aggregations available in the national data mask huge variations within purchaser markets of the boat and shipbuilding industries. Among ships, for instance, are fishing boats, and within fishing boats are large and relatively small commercial fishing ships. Such ships are typically built and outfitted for particular fisheries, the fortunes of which ebb and flow. Beneath the surface of such fishery niches are stories of restructuring and competition in shipbuilding.

Broadly, informants reported that the rising prominence of larger fishing ships have influenced the smaller fleet to repair and refit in preference to purchasing. Several shipwrights in this case reported shifting their focus to repairing and refitting fishing boats. At the same time, sales of larger recreational boats (including yachts large enough to be classed with ships) have grown significantly, and some shipwrights in this case have focused on recreational markets. The point, for now, is that purchasers of boat and shipbuilding and repairing services are more diverse than they may appear. It is not simply a matter of building fishing boats, sailboats, or yachts, but of innumerable markets for production and repair of, for instance, passenger cruisers, tugs, fishing boats of various uses (i.e., trawlers, seiners), wooden, metal, or fiberglass hulled boats, etc.

From the shipwright's perspective, some of these markets are complementary. Since the work of ship and boat building, at least in this case, is overwhelmingly customized, a shipwright may shift fluidly among divisions of the industry. Over the longer-term, however, many of these divisions require specific dedication of resources in tooling, knowledge and positioning. Such strategic imperatives can rise to the district level, as is observed in this case around the installation of a large ship haul-out in the

rather small territory of the Port of Port Townsend. As shipwrights and the affiliated marine trades producers of Port Townsend address matters of their own long-term strategic positioning, they appear to be increasingly bound together within the growing marine trades district.

#### **Site and setting: The marine trades in Port Townsend**

The focus of this case study is a cluster of marine trades firms in Port Townsend, Washington. Port Townsend (population 8,259) lies in Jefferson County (population 25,945) at the northeastern tip of the Olympic Peninsula, where the Strait of Juan de Fuca meets the Puget Sound (USA Counties 1998; US Census Bureau 2000).

This location has three attributes that make it a favorable for the marine trades activity. First is its proximity to the Seattle metropolitan area, which affords good access both to industrial and recreational boaters as well as specialized suppliers. Second, it is favorably situated at the intersection of two major marine routes: one being the "Marine Highway" that provides sheltered passage to fishing and other craft between Washington and Alaska; the other being the Strait of Juan de Fuca, which joins the Puget Sound to the Pacific Ocean. Third, the area has developed both a look and a reputation as a center for wooden boat craft, and the romantic aspects of this has generalized to the locations attractiveness as a place to both work and shop marine trades.

The shipyard at Port Townsend includes firms that both manufacture and repair ships and boats, as well as a wide variety of supporting goods and services firms. During the course of this study, the Port of Port Townsend developed a "heavy haul-out" capable

of transporting ships of up to 300 tons (about 115 feet). Prior to that, the haul-out facilities of the Port were capable of lifting out ships of up to 70 tons (40 feet).

### **The industry in place**

County Business Patterns data is available at the three digit SIC level for shipbuilding in Jefferson County between 1992 and 1997. In 1993, employment in ship and boat building and repairing building (SIC 373) was 214; in 1995 it was 175; in 1997 it was in the range 100-118. In each of these years, County Business Patterns identifies 14 shipbuilding establishments in the county. Field observations from this study suggest that the declines in the shipbuilding employment in Jefferson County are probably due to failures or relocations by a succession of large employers, and also, in part, to year-to-year employment variations, transitions by some firms out of ship work as a primary trade, and errors in the survey itself. Between 1993 and 1997, when boat building in Jefferson County declined by about half, the county's total employment increased from about 5000 to 7600. (The U.S. same figures show the same trends, but to a much smaller degree: boat building declined by three percent and total employment increased by eleven percent.) Location quotients comparing shipbuilding employment in Jefferson County to the United States were 26.01 in 1993 and 10.5 in 1997, due mostly to industry losses and total employment gains at the local level. Those figures indicate a marked local specialization in shipbuilding, notwithstanding the local decline in boat building.

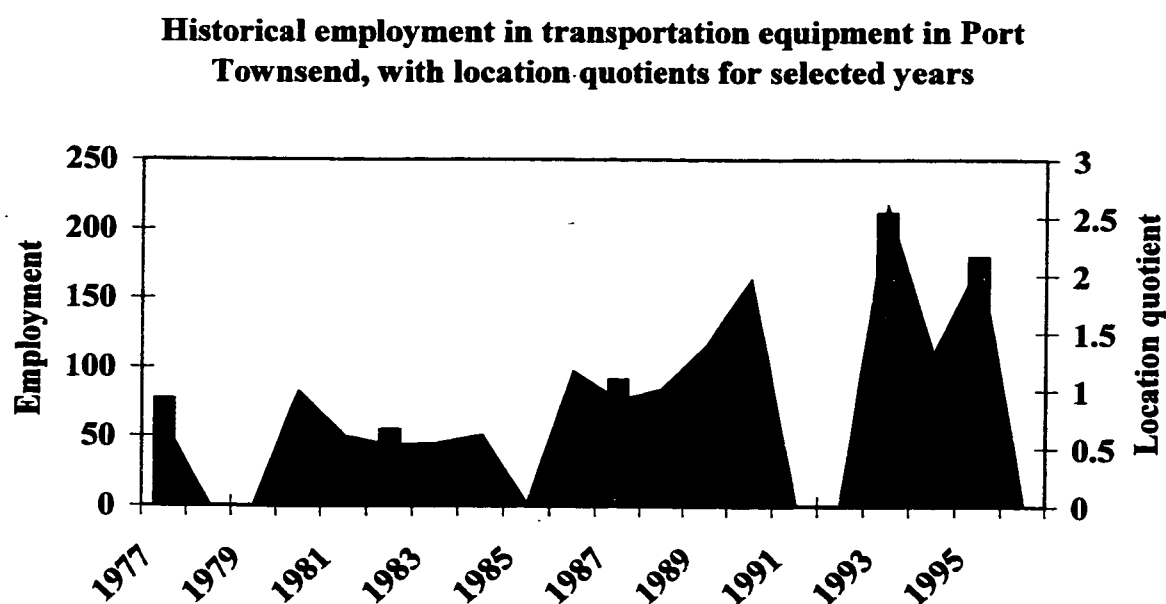
The 1992-1997 County Business Patterns shows that all establishments in Jefferson County classified in SIC 37, transportation equipment manufacturing, were also classified as SIC 373, ship and boat building and repairing. In that period, at least, the

data suggests that all county employment in the broader SIC category of transportation equipment (SIC 37) can be attributed to shipbuilding; this enables the examination of two-digit SIC data available for a longer period under the assumption that the Jefferson County numbers reflect local shipbuilding activity. County Business Patterns data were gathered for employment in transportation equipment, and all employment in the years 1977 through 1996 (US Census Bureau 1977 - 1996), and are summarized in figure 5.2 and table 5.2 below.

The location quotients shown here compare local to national employment in the broader industry of transportation equipment, a two-digit SIC level of aggregation that includes automobiles and aerospace manufacturing as well as shipbuilding. Missing local employment values can be seen in some years, but the data shows that shipbuilding employment in Jefferson County fluctuated between 1977 and 1984 at around 50 employees; a decline from a high point in 1980 is probably due mainly to the failure of a single large boat builder. The years 1987 to 1993 entailed a significant expansion. In this period, the local industry expanded from its 1984 level of 50 employees to a peak of 214 employees in 1993. In my assessment, the fluctuation in total employment between the years 1994 and 1996 are mostly a reflection of hiring and layoffs in a single large yacht manufacturer, although they may also reflect year-to-year variations in fishing and recreational boat work, variations in employment by other area firms, and estimation errors in the data.

Setting aside year to year variations over the period of this data, both employment and location quotients show fairly consistent growth between 1977 and 1995. The

location quotient for transportation equipment manufacturing employment in 1977 was 0.92, suggesting a substantial local specialization. Following a dip in 1982, employment grew (particularly in the 1986 to 1993 period), and the location quotients rose from .65 in 1982 to 2.54 in 1993. These figures suggest increasing local concentration of employment in transportation equipment, which is probably entirely attributable to boat building activity. These data support the view that the area-industry gained competitive advantage in the rather brief period between 1982 and 1993.



*Figure 5.2: Historical employment in transportation equipment in Port Townsend*

*Table 5.2: Boat Building (SIC 37) and All Employment in Jefferson County and the United States: 1977 to 1986*

	Jefferson County			United States			LQ
	SIC 37	All Emp.	Percent	SIC 37	All Emp.	Percent	
1977	58	2,287	2.5%	1,793	64,976	2.8%	0.92
1978		2,559					
1979		2,814					
1980	81	2,883					
1981	49	2,749					
1982	43	2,961	1.5%	1,652	74,297	2.2%	0.65
1983	44	3,023					
1984	50	3,160					
1985		2,876					
1986	96	3,275					
1987	75	3,229	2.3%	1,824	85,483	2.1%	1.09
1988	84	3,314					
1989	114	3,552					
1990	162	4,059					
1991		4,218					
1992		4,648					
1993	214	4,991	4.3%	1,602	94,789	1.7%	2.54
1994	108	5,078					
1995	175	5,273	3.3%	1,544	100,335	1.5%	2.16
1996		5,272					

Source: Census Bureau 1977 - 1996

### Attributes of the complex

The products of the marine trades cluster of Port Townsend include the repair and building of fishing and recreational boats, along with numerous goods and services specialties that support marine building and repair. The dominant activity in commercial boats entails the repair of smaller (70 tons, about 40 feet) fishing boats. A secondary component of commercial boat building is in large, commercial yachts, including passenger touring crafts. In this product class, local production activity is oriented to the manufacture of new recreational ships. A third element is in the production and repair of sail and other recreational boats.

Smaller recreational craft are distinct and highly visible in Port Townsend, though in terms of revenue this may be the smallest of the three product classes described above. The shipyard is ringed by sailboats that are in storage and under repair. Historically, the Port and its shipyards offer inexpensive space for hobbyists to work on their boats at an unhurried pace, contracting work as needed to local shipwrights and "tailgaters." (This local term refers to specialized craftsmen that undertake ship building and repair without a base facility, and includes seasonal and itinerant workers.) One of the principal tensions within the local industry is the competition for limited space between the larger and more lucrative commercial boat sector, and the smaller, more lifestyle oriented boat hobbyists and tailgaters.

The Port Townsend area has a specialization in wooden boats, a material that is associated with particular methods and features of industry organization. These activities associate the area as a center for this rather romantic segment of the industry. Wooden boat work includes both recreational and fishing boats. Among the institutions in this cluster are two that are oriented to wooden boats specifically: the Wooden Boat Foundation (which in 1973, and every summer since, sponsored the popular Port Townsend Wooden Boat Festival) and the Northwest School for Wooden Boatbuilding.

This niche does not exist to the exclusion of other methods of boat building. Since the early days of this cluster, and persistently, some boat builders in Port Townsend have produced fiberglass and metal boats of various sizes and uses, and these have included some of the larger firms in the area industry. This distinction between the traditional wooden and more contemporary methods and materials was often described

by informants in dichotomous terms, with wooden boats associated with small, craft, and community-orientation, and others associated with a larger size, mass production, and industry-orientation. This general dichotomy appears fairly accurate from a historical perspective, but development of the area industry has tended to blur these distinctions. Early relations in the Port Townsend cluster were described by many informants in terms of a social movement. With development of the area industry, even traditional shipwrights have become increasingly professional and oriented to strategic business management.

Marine trades activities are concentrated in two locations within the community of Port Townsend. The main location is in Port of Port Townsend shipyards, about 15 acres which is the location of the majority of the city's marine storage, ship building and other marine trades, as well as a variety of other unrelated activities. Highly visible in this territory are the working spaces for larger boats, which exist outdoors and in barn-like workshops and covered spaces. Many establishments are difficult to locate and identify. The overall layout of the Port is chaotic, with few well defined streets. Small offices and workshops are commonly tucked into lofts, and two or three different specialty firms can frequently be observed sharing workshop space.

The second local concentration is at the north shore of the town, where five main buildings house a variety of marinas and smaller marine trades businesses, including the Wooden Boat Foundation. This area lies at the northern terminus of Main Street. The combination there of marine trades work, yacht and sailboat moorage, and public park



space provide a visually romantic sense of the city as a community of “old fashioned” boats and boaters.

Perhaps it is in the nature of boat work that the lines between firms are, by and large, not property lines. At both the north docks and the main port shipyard, the physical spaces of the industry appear more as campuses than traditional business locations. In some places, common space appears to be used opportunistically by different firms. Other marine trades establishments are diffused throughout the community, including in its business and industrial park, airport, and other locations. The Northwest School for Wooden Boatbuilding, for instance, is located in the industrial park, well above and away from the waterfront. Driving toward the city, boats can be seen in the yards of private homes, set up on cribs, with work in progress.

The local marine trades complex can be charted on the basis of a local directory of producers (Jefferson County EDC 1996) and my interviews. The complex is considerably deeper and more complex than appears from visual impression. Hull fabrication and repair are the most visible activities, but these are surrounded by goods and services producing activities that support and supplement hull work. I classify several production activities as central to boat building, shown in the center column of the following chart.

Lofting (the process of transferring the complex lines of a hull from blueprint to full scale and dimension) is done by hand methods as well as by computer aided design and manufacturing. The old methods of lofting by hand are taught locally by the Northwest School for Wooden Boatbuilding. At least two local boat builders design and

produce hulls using sophisticated CAD/CAM techniques, using software produced by a local boat manufacturer (and informant). In hull building proper, the Marine Trades Directory for 1995-6 lists 17 establishments in this category, a somewhat larger number than the 14 firms identified by County Business Patterns.

A variety of firms and freelancers specialize in systems contained in the boat. These include engines, and drive systems (engines are not manufactured locally, but most elements of drive systems can be, and often are, locally fabricated), rigging, hydraulics, storage, fuel, and fish holds, and refrigeration systems (used commercially to chill or freeze fresh fish at sea). Interior finishing includes both the living and working spaces of the boat. Storage and launch services include moorage and on-land storage as well as moving and launch services, and the major operator here is an institution, the Port of Port Townsend.

Goods producers ancillary to boat building are shown in the left column of the chart of the complex.<sup>49</sup> Chandlery is marine hardware; for this, informants reported both local and regional sources. Wood used in boat building involves specialized planking and marine plywood used in wooden hulls and decks, and interior wood for interior use in cabinetry, millwork. Wood is also used extensively in the traditional process of lofting. Informants reported purchasing wood from two main sources. First is Edensaw, a specialty wood wholesale/retailer in the Port Townsend area, which itself reported shipping marine wood to regional and national markets. Second, most small and medium

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<sup>49</sup> The term "ancillary" does not imply that these activities are subordinate or subsidiary, only that they are additional marine trades to boat building. These goods and services are routinely purchased directly.

sized shipwrights reported getting needed planking directly from small scale logging operations within the Pacific Northwest.

Metal fabrication, which generally involves cutting, bending, and fusing metal, is involved in the manufacture of many boat components, from fuel tanks and fish holds to elements of the drive system, and similar parts. Two local foundries do brass casting for marine applications. Machining typically involves the use of bits and lathes to produce precisely measured, curved machine parts. Interestingly, in recent years, machine shops appeared to have emerged in the Port Townsend area as a cluster in its own right. Seven firms specialized machining firms were identified, in addition to machining work performed by large and mid-sized shipwrights. In total, informants estimated there were about 30 skilled machinists working locally in 1998, and these were engaged in both the marine trades complex and in production for aerospace and other specialty applications (two, for instance, reported producing parts for scientific equipment such as linear accelerators).

Painting and finishing applications involve both hull and interior applications. This research identified some small operators that specialized in such work. The majority of finishing work, however, is performed in-house by boat building firms, in the largest cases, by a specialized team of workers, but more typically by general shipwrights. Two sail makers and two canvas working firms were identified in the Port Townsend cluster, and for the most part, these firms appear to have their own family tree. As might be expected, sail making generally serves the recreational markets and typically perform work directly for consumers in regional markets. Canvas applications are more woven

into the local complex, since many boats are outfitted with canvas elements. Canvas working firms also appear to produce products direct for final consumers, such as the “dodger,” which is a fabric canopy used to shelter the open cockpit of a sailboat at sea.

Interior woodwork is quite similar to cabinetry and other finished carpentry, although considerations of weight, space and water environment mean the materials and designs are often quite distinctive. This work was observed as a specialty performed both in-house and by small, specialized contractors. Hydraulics work is common to commercial ships, and the appears to be most typically performed by specialized subcontractors in the Port Townsend cluster.

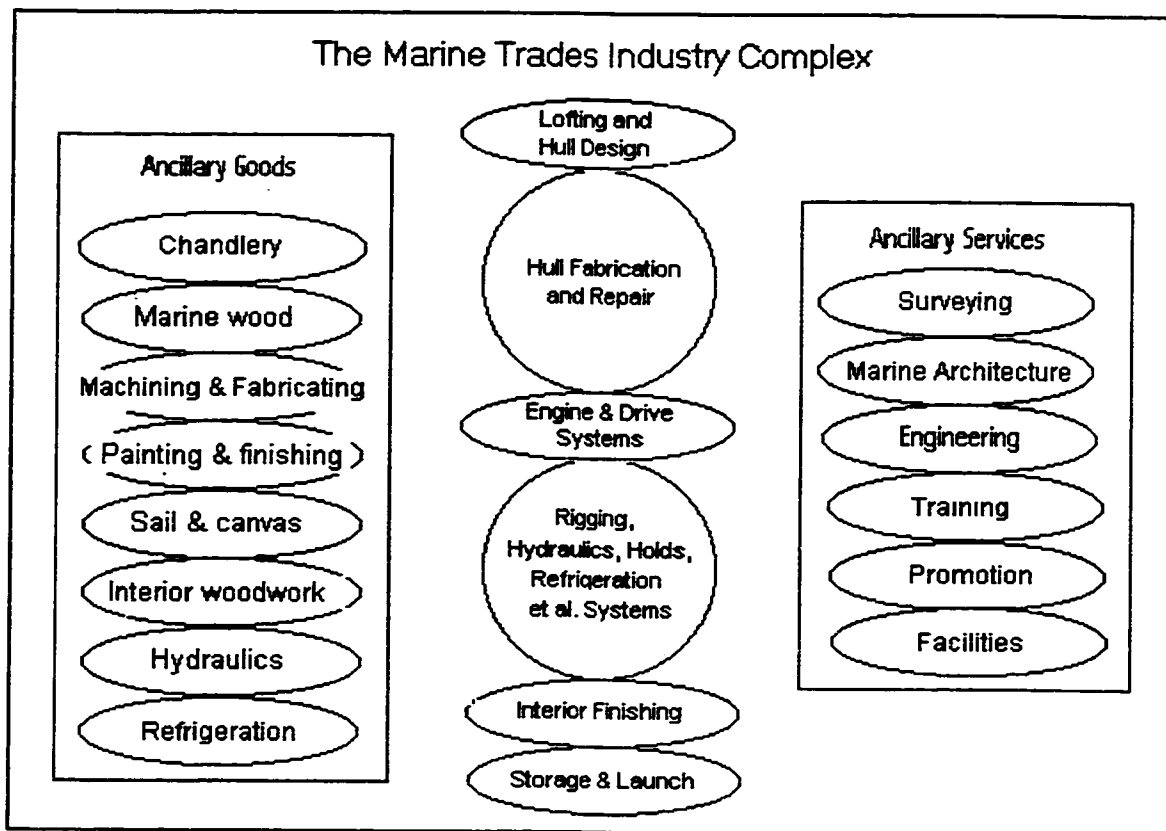
Marine refrigeration work in Port Townsend involves industrial applications for commercial fishing boats. The refrigeration unit chills the catch hold and is used to preserve, or even freeze, the catch at sea. Locally, this appears to be important to smaller fishing boats as a means of maintaining superior quality of the catch. One of my informants had developed a compact and efficient heat transferring component, and had shifted out of general boat building and into the production of refrigeration equipment. Such units were sold both in regional and international markets, as well as being contracted to customers who brought their boats to the Port Townsend marine trades center for periodic and more extensive overhauls. While other shipwrights perform work related to installing refrigeration equipment, this single firm constitutes the only primary manufacturer of specialized in refrigeration equipment in the area.

Ancillary services are shown on the right column of the chart. Marine surveying is an insurance specialty, which involves the third-party evaluation and appraisal of boat

repair. In some instances, surveyors in Port Townsend broker contract work among a variety of producers. I interviewed one of the two local firms in this specialty, which reported working throughout the Puget Sound region. Marine architecture is similarly regional.

Specialized training services are provided by two quasi-public institutions. First is, the Northwest School for Wooden Boatbuilding, which has been mentioned as an early and abiding magnet of boat builders to the area. Second is an initiative of the local Economic Development Council (EDC) which, under federal grants, developed trade-based training in marine crafts such as fiberglass and hydraulics.

Promotion and marketing of the local cluster is done variously by other institutions. For instance, the Marine Trades Association is loosely run by the local EDC, whose efforts include organizing representation in regional trade shows and publishing the directory of local marine trades firms. The Wooden Boat Foundation functions as a community service arm of the industry, and annually organizes the longstanding Wooden Boat Festival. The Port of Port Townsend operates the main locations of marine trades activity, and also has a recruitment function.



*Figure 5.3: The marine trades industry complex*

**Markets.** The main markets for goods and services of the Port Townsend marine trades cluster are regional. In the typical case, the commercial fishing boat operator fishes waters off Alaska in season and attends to maintenance and overhaul work in the off season. Markets for recreational boats are similarly regional, with most informants reporting recreational boat work concentrated in the Puget Sound, but ranging from Oregon to Alaska. The Canadian market was almost never mentioned as a market source. Port Townsend provides a convenient location, and according to Port Manager Lloyd Cahoon, is one of only three marine service facilities on the West Coast that offer full service marina work by more than one firm.

In the typical case, owners bring their boats to the site, where work is arranged by one or many different firms. In some cases, the boat owner acts as the lead contractor and worker. Given the bulky nature of the product, it is easy to see why most markets are regional. Some producers, however, have developed niches in markets that reach well beyond the region. Producers of sails, canvas products, kit kayaks, and marine refrigeration equipment fall in this category, as do producers of large yachts. For yacht builders especially, competition is defined by global firms and conditions. In most cases, however, primary markets are broadly regional, extending to Alaska, Oregon, and Northern California, with less frequent reach to more distant markets.

The internal market for contracting among firms and teaming on jobs, is rich in the Port Townsend marine trades cluster. Contracting among firms, and teaming on projects by independently hired producers, was commonly reported by nearly all firms except those few firms whose products are shippable. In the typical case, boat owners come to Port Townsend for repairs. Firms of medium size (5 to 20 workers) typically act as primary contractors. Subsidiary work may be subcontracted by these firms, or the boat owner may arrange for component work independently. In slack times, generally, the medium sized commercial boat repair contractor will keep work in-house that in busier times would be subcontracted out to other local producers. One representative firm reported always contracting machining, sandblasting and rigging elements but only sometimes contracting for engine and hydraulics work. This dynamic – of moderate sized firms alternating between a wide and narrow scope based on the volume of demand – appears to be a common dynamic of local contracting.

Virtually all production in the Port Townsend marine trades complex is custom work. Only one mass production firm could be clearly identified: Pygmy kayak, a manufacturer of kayak kits. The president of this firm reported producing standardized products by production line methods. He also reported having developed software for hull design used by this firm and other boat builders and marine architects in the area.

In the literature on flexible network formation, establishing trust is commonly called out as a difficult and essential step in establishing practices of multiplex contracting. In this case, community pressures for high quality performance appears to enable the local culture of flexible contracting. Informants repeatedly emphasized that the area is a center for high *quality* marine trades work. Contracting among firms appears to entail quality enforcement.

**Technology.** For the most part, marine trades producers employ old technology in craft forms of work organization. There are some notable examples of CAD/CAM in hull design and molding, the use of composites in non-wood hull production, and the installation of networked electronic instruments. At least two local machining firms and one primary boat builder reported doing specialized and technology intensive work for the aerospace and scientific instruments industries. A sail maker reported phasing into computer assisted equipment for marking and cutting sails. For the most part, however, producers reported using older technology that is common to the trades.<sup>50</sup>

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<sup>50</sup> To call the technology in common use in this cluster "flexible" would probably be an injustice to the term as it has been used in some recent discourse on flexible specialization. In discussions about flexible technology, most literature tends to highlight technology that, by design, enables rapid retooling for different products, such as CAD/CAM. As Gertler (1988) wryly observed, a hammer is a very flexible tool.



***Supply and ancillary goods and services.*** The development of this complex is characterized by the thickening of the industry into ancillary goods and services. In general, the proliferation of firms in material supply and services can be observed and associated with the acceleration of clustering and proliferation of firms beginning in the early 1980s and accelerating thereafter. Examples include the proliferation of chandlery, wood supply, machining, surveying, and marine design firms. Respondents reported still looking to Seattle for many basic products, including finance and some materials and hardware. The proximity of this cluster to the Seattle area may be noted as a source of advantage.

***Institutions.*** Formal institutions are rich in this case, and can be traced to early in the cluster's formation. Four main institutions are evident today in the Port Townsend marine trades cluster: The Wooden Boat Foundation, the Northwest School for Wooden Boatbuilding, the Port of Port Townsend, and the Jefferson County Economic Development Council. With the exception of the school, these institutions appear to do a variety of things to help the industry, including training, community service, promotion, and facilities management. It is reasonable to say that some of these institutions have played a central role in the district's formation.

***Size differentiation among shipwrights.*** Although few marine trades firms outside the shipwrights have grown to more than small shops of up to 15 employees, shipwrights take three distinctive forms and sizes. The largest shipwrights are in the 50 to 150 employee range. It seems that the Port Townsend cluster has frequently had some firm making a play to emerge as a major, anchor firm. The first was Skookum Marine, a

manufacturer of small fiberglass fishing boats, which was in operation even before the cluster emerged in the early 1970s and had failed by 1978. Another more recent player, Admiral Marine, builds very large yachts. That firm moved its main location to nearby Port Angeles in 1998. Most recently, Falcon Marine emerged as a manufacturer of aluminum-made passenger catamarans, a venture that failed in less than one year. In busy times, these large firms were reported to generate substantial contract work for the area industry, but the large ship producers appear to be terribly volatile, vacillating in size dramatically based on contracts for large ship production.

Medium sized boat building firms of 5 to 25 employees appear to be the stable heart of the cluster. Ten medium sized boat builders can be identified from this research. These firms report a capacity to undertake a wide variety of boat work. All those interviewed reported routinely contracting out some types of specialized work, and likewise contracted in work as well. These firms are the core of contracting practices within the cluster. Interestingly, it appears that these businesses vary the scope of their own work according to general demand. In busy times, the mid-sized shipwright will specialize and contract out a greater proportion of a job, and conversely, in slack times perform a wider scope.

Small boat building firms are typically 1 to 3 workers, and may have a small shop or marina or may have no fixed workshop location at all, i.e., the “tailgaters.” A small number of small shipwrights operate small marina spaces with a wholesale or retail specialty on the side, comparable to the small automotive garage. The tailgaters include shipwrights and many other specialties, are made up of a diverse sub-population. Some

of the top tailgaters are highly skilled and trusted both as craftsmen and consultants.

Others are incipient entrepreneurs that have gained some skills in the area and struck out on their own, with varying growth orientations. Some are casual and itinerant one-person businesses who fish or travel and return seasonally to Port Townsend.

### **Summary points in overview**

The above discussion has identified a few features of this cluster, which provoke more detailed discussion in the case of the district.

- Data at the national scale support the observation that the Port Townsend marine trades complex has generated a marked concentration in ship building. Looking at the state of Washington, the markets for ship repair as well as recreational boats appear to have grown significantly.
- In transportation equipment alone (a category that excludes many types of ancillary trades within the marine trades complex), national data suggests that the Port Townsend marine trades cluster grew from about 50 workers in the late 1970s to a peak in 1993 of over 200 workers. A wide variety of specialties is evident from local sources and interviews, and these are probably not classified in boat building for purposes of national statistics.
- Contracting within this cluster is a primary method of management and work organization. In nearly every interview conducted for this research, contracting was mentioned as common and integral to operations. Practices of referring surplus work to other local firms also appeared to be common.

- The cluster is constituted by a wide array specialties and firm sizes. Larger firms can be identified at various times in the cluster's history, and these are evidently subject to huge market volatility. Larger firms were reported as a source of contracting by smaller and mid-sized firms, but it does not appear that large firms are integral to this district's function. The Port Townsend marine trades complex attracts a market by offering many local options for contracting and organizing any given job.
- The area industry is characterized by rich institutions, which provide a variety of services including the provision of industrial space and haul-out equipment, training, and promotion of the area and industry as a center for marine trades work.
- Nearly all marine trades work in the area is done on a custom basis. Informants reliably maintained that the area is both better and cheaper than comparable work in the Seattle-based core of this industry. Whether or not this is true, the ethic – *better and cheaper* – denotes qualities expected of local producers.<sup>51</sup>
- While the fishing industry is subject to volatility that dampens the overall attractiveness of that market, fishing boat repair remains the largest source of work. At the same time, the Port's new heavy haul-out has greatly expanded the possibilities for working on larger ships, and the general growth in fortunes of the Seattle metro area has generated growth in recreational boating.

These attributes (contracting and institutions) create what Crevoisier (1996) calls a "backcloth" that shapes processes of firm entry, growth, diversification, and niche

targeting. In other words, the community has a logic and intelligence that favors multiple firms and contracting options and fluid contracting relations. Within this general practice is a world of competition that is often both friendly and intense.

*Development sequences in district development: The emergence of marine trades in Port Townsend*

This section examines the marine trades cluster in terms of its historical development. The object here is to use informant comments to trace significant aspects of district development over time.

I examine the idea that district formation is underpinned by three dynamics – location, externalization, and agglomeration – which play out in rough sequence. Location is observed in moments of development, such as the time of first formation; proliferation; and thickening. Externalization refers to basic features of the industry, such as its markets or production technology, that favor general growth (positive external economies) or decline (negative ones) in an industry. Conditions of externalization need not be localized and can be global, but are often regional in nature.

Agglomeration refers specifically to *local* external economies, or to conditions that promote localization and concentration, such as workforce advantages, information advantages, thickening of ancillary goods and services, shared infrastructure. Institutional responses are prominent in this case, including the development of training programs, ship haul-out facilities, etc., all of which can be placed as early features of this

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<sup>51</sup> This was affirmed by a fisherman who said, “There is in Port Townsend an incredible concentration of skill. It is higher skill and cheaper than is found in Seattle. Port Townsend has built a reputation for

cluster that promoted further clustering. Coming early in the sequence of district formation, as they do, I discuss institutional activities in the context of general external economies, in the second moment of district formation. I reserve the discussion of contracting practices to the last part of the chapter.

A second broad set of expectations will also be considered in this section, concerning the fit of three alternative views of district development. Scott and Storper's (1987) theoretical proposal is quite specific with regard to the formation of new districts. They suggest that districts are the product of centrifugal effects – from both established production centers and integrated firms – and arise out of external diseconomies of labor, cost, and regulation in mature and centralized firms. This case is a good test of Scott and Storper's theorization, since it is evident that some of the first producers relocated from the Seattle core of the industry. They also suggest particular mechanisms of clustering in place: that industry clustering arises as a result integrated firms that disintegrate under pressures of market change and instability, but remain localized when high transaction costs favor concentration over spatial diffusion.

There are two main alternative views. Rosenfeld (1997) suggests that the clustering of businesses precedes the emergence of district benefits in general and collaborative benefits in particular. This view suggests that collaborative efficiencies are effects of prior concentration, not the reverse (i.e., organizational norms neither generate industry clustering, nor are concurrent with clustering). The other expectation concerns innovative milieu of the French school (Crevoisier, 1996), which holds that districts are

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excellence.”

one type of organizational solution commonly found within entrepreneurial communities. This view suggests that districts do not emerge out of uncontrollable external conditions, but rather reside in communities that develop a mode of district organization as one type of solution to changing external conditions. Practices that facilitate tactical coordination among local players, in this view, are likely to be early and endemic features of district formation.

Informants with a history in the area placed the emergence of the Port Townsend marine trades cluster between 1976 and 1978. Before 1996, marine trades work was done by a few firms, including a Skookum Marine, a medium-sized manufacturer of fiberglass boats, Fleet Marine, a marina and repair shop, a sail making shop, a few individual wooden boat builders, and the Port of Port Townsend, which operated mostly as a moorage. The area had an earlier history as a marine trades center. By 1978, at least ten marine trades businesses and two institutions had emerged in Port Townsend. Then, as now, the activities can be described in two overlapping focuses: the craft of wooden boat building, and the industry of ship fabrication and repair.

Stan Connor, a local wooden boat builder (who has long since departed from the area) was cited by several informants as being the most prominent player in the push that brought significant attention to Port Townsend as a wooden boat center. Together with three or four others, including a sail maker and a writer for a national wooden boat magazine, Connor established the Wooden Boat Foundation in 1996, and in 1997, launched the Wooden Boat Festival. The festival remains an annual event in Port

Townsend and is a regional and national attraction. At the time, the festival succeeded in drawing attention to Port Townsend as a center for the revival of this craft.

Informants in the wooden boat scene at the time include Carol Hasse, a sail maker; Bruce Tipton and Mark Burn, who were both wooden boat builders at the time (today, Tipton is an independent rigger, and Burn manufactures refrigeration equipment). Without exception, these informants characterize this as a heady time. One informant described it this way:

There was a real perception of romancing, being a shipwright, it was kind of the in thing to do. There is a certain attraction to this lifestyle.

Anyway, they (Connor and others) had a little shop downtown and they were the ones that really got the Wooden Boat Festival started.

This local thrust appears to have caught a number of broader cultural waves, including general counterurban migration motives, and back-to-the-land (or sea, in this case) nostalgia for traditional work.

Another main component of the emergent cluster was oriented to boat building as an industry. This segment was more attuned to serving commercial markets and less oriented to wooden boat crafts. By all accounts, in 1976 Skookum Marine was Port Townsend's largest established boat manufacturer. That firm manufactured lines of fiberglass fishing and recreational boats. Smaller producers reported included Fleet Marine, a boat building and servicing shop. Informants also refer to Mark Burn and his shop, Port Townsend Boatworks, among the early commercial-oriented boat builders,



which is notable because it is evidence of social linkages between the wooden boat community.<sup>52</sup>

By 1978, Admiral Marine had relocated its operations from Seattle to Port Townsend. The founder, Earl Wakefield, had made a career teaching boat building in Seattle programs and practicing his trade, and moved to Port Townsend to concentrate on building larger recreational boats. He reported that firm relocated to Port Townsend at the urging of a friend, a local physician in Port Townsend, and others. (In the course of the next 15 years, Admiral became a major producer of large yachts, and by far Port Townsend's largest marine trades employer.) This firm appears to have relocated to Port Townsend, in part, to avoid costs associated with labor organization in the Seattle area. Wakefield was the only informant to note avoidance of union organization as a factor in the location decision.

The emergence of industrial boat builders alongside the wooden boat community was described by my informants as giving added credibility to Port Townsend as a marine trades center, both within town and regionally. The relocation of Admiral Marine and other firms to the Port Townsend area tended to reinforce that.

During this time, the Port of Port Townsend emerged as an institutional player supporting the industrial growth of marine trades businesses. The Port established infrastructure and policies that were oriented to attracting small boat builders and marine

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<sup>52</sup> I suggest here that the two main elements of the boat building industry in Port Townsend entail industry and craft communities, but the distinction is fuzzy. For instance, many fishing boats' industrial use associates them with the industrial side of this cluster, but many small fishing boats are wooden hulled, requiring the craft skills of wooden boatwrights. This middle realm appears to have been a small part of the early cluster, but later emerged as the fastest growing element of the industry.

trades firms. The Port, for instance, made cheap space available for boat owners who needed to store and work on boats. It provided industrial space for marine trades firms. Most significantly, the Port established a haul-out capable of moving ships of up to 70 tons (40 feet) to different work and storage sites.<sup>53</sup> Port director, Lloyd Cahoon, maintains that Port Townsend is one of only two ship haul-out facilities in the Northwest where full marine trades services are provided by more than one firm.

It seems possible that actions by the Port of Port Townsend could have had a major influence on the early form and development of the cluster. On its face, the Port management reduced barriers and costs of entry for shipwrights in Port Townsend, which has been identified as a “hard” agglomeration economy (as opposed to the softer ones associated with collaborative efficiencies).

I conclude that the Port has had such an influence. But another question is whether the Port management was decisive in the early formation of the marine trades cluster. The best evidence I have on this score is from the accounts of people who were involved at the time. When asked directly if the Port’s actions were integral to establishing this cluster, my informants said *no*. Some manufacturers of boats had been established in the area, the wooden boat community had generated local excitement, and the Port Townsend marine trades cluster was on the map before the Port turned its attention to it. The Port’s institutions and infrastructure did reduce costs and barriers to entry (an agglomeration economy) and help foster this cluster’s emergence. My

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<sup>53</sup> The precise nature and timing of Port actions to build infrastructure dedicate Port to marine trades businesses is difficult to pin down. Even the development of the ship haul-out facilities eluded my efforts

interviews, however, clearly suggest that the Port was not an active *social* player in the cluster's emergence; it seems to have become attuned to encouraging development of the marine trades cluster only after it had gained momentum as a craft community. Note this comment:

The Port made the investment in the yard and the lift out facilities. That provided a place to work on boats without a huge investment on the waterfront. But there was something else that is harder to define, something about the people and their philosophies in the community that made a big difference. Admiral, even though they are a yacht builder, they are different yacht builder. We were a different ... firm. We were committed to the art, not just the economics. Not that everybody isn't, but there was something here that was hard to find elsewhere.

In the beginning, then, this nascent cluster appears to have been instigated by a small cadre of boat builders and aficionados who succeeded in recruiting a market as well as some promising firms to the Port Townsend area. The infrastructure investments of Port of Port Townsend appear to have been significant as a space where shipwrights could cluster. The history of this district may be said to begin, however, with the creation of a second, more social institution, the Wooden Boat Foundation. The energy generated by the success of the Wooden Boat Festival (the primary function of the Foundation), combined with the demonstrated success of some boat building firms, appears to have been carried forward in the recruitment of some serious businesses to the community, and the successful projection of Port Townsend as a romantic center for craft revival. While I

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to date it. We do know that the Port of Port Townsend had been in existence for about 50 years by 1978.

cannot precisely identify all the marine trades firms in existence prior to and following this period, my informants consistently maintained that the period from 1976 to 1978 involved an industrial epiphany that generated joint efforts and spawned a dense and growing cluster of marine trades producers.

Let us turn now to a second moment in this cluster's development, the period from 1980 to 1989. This is a period of firm proliferation and thickening, of growth in producers and institutions, and of crisis. The attraction and creation of firms to Port Townsend appears to have continued. By 1980, census figures show about 75 employees in the ship building industry, and relatively consistent growth through the following decade to about 150 employees by 1989 (recall that the numbers in figure 5.2 are exclusive of workers classified in marine trades other than ship and boat building).

By 1980, Skookum Marine had developed a line of fishing and recreational boats, and appears to have invested heavily in fiberglass molding and other equipment enabling larger scale production. Among its products was a trawling boat targeted to a certain fishery. The fortunes of that fishery plummeted under high interest rates and poor conditions in that segment of the fishing industry, and Skookum's fortunes fell with it. Skookum's commitment to larger scale production had tied the firm to the success of this volatile market. The firm dissolved shortly after, and its owners scattered. My informants suggested that some of this firm's leadership remained in the Port Townsend area industry for a few years, but none of the executives remained long or were reabsorbed in the area industry. The overall employment impact of this layoff can be

seen in figure 5.2 as an employment decline between 1980 and 1981. My informants could not speak to the absorption of workers into the area industry. Note this comment:

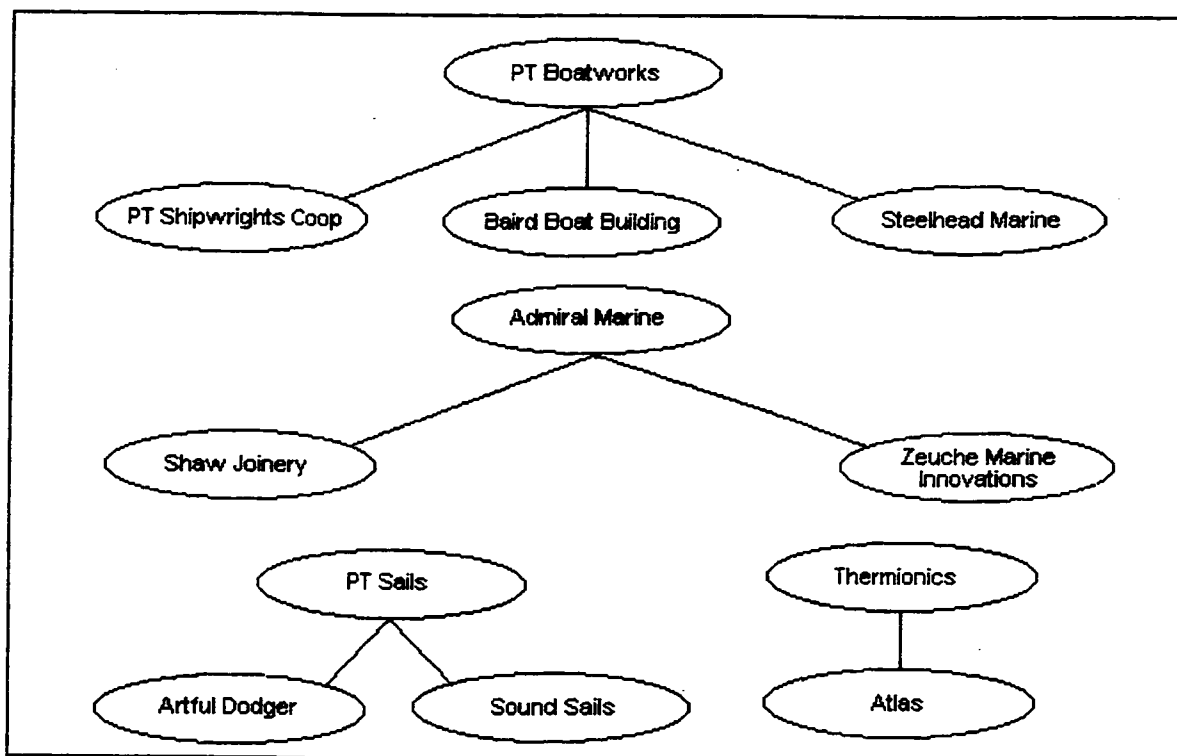
Skookum saw their market growing and, partly in response to that, built this mold for a 70 foot troller... In 1980, I think Skookum only sold one of those boats and they had a really difficult time because the industry which they were dependent on, it just went extinct. That is partly what happened to us. It just disappeared. It was amazing.

The failure of Skookum Marine reflected macro level shifts that affected other producers in the Port Townsend area. In particular, my informants reported that high interest rates around 1980 dampened demand for marine trades producers throughout the Port Townsend cluster. This did not just affect the dissolution of Skookum. Some craft boat building firms found themselves overextended as well, and were forced to retrench.

Volatility and restructuring in the fishing industry makes this a difficult industry to mass produce boats for, but that does not mean that the industry at large is not viable from a boat building perspective. I will not detail the myriad dissimilarities among types of fishing boats – trollers, seiners, etc. It is sufficient to note that conditions in particular fisheries, as well as technological restructuring toward larger fishing boats, hold refrigeration, and similar changes combine to keep a steady flow boat building and repair work coming to Port Townsend, in spite of the rising and falling fortunes of the various downstream markets. The point here is that market volatility and the highly variable nature of boat repair work tends to reinforce craft and custom production and discourage mass production.

Some instances of the splitting off of workers into new firms – firm fission – can be traced to this period. One example is Port Townsend Boatworks (Mark Burn). Seven core workers split off from that firm in 1980 to start the Port Townsend Shipwrights Cooperative, a firm that has expanded to 12 co-op owners and continues to operate today.

Other examples of firm fission can be identified, suggesting that in this case, too, firm fission is a prominent mode of firm proliferation within the district (figure 5.4). The examples shown in the figure represent parent firms of various types: small craft-oriented shipwrights (Port Townsend Boatworks, larger ship builders (Admiral), ancillary products (Port Townsend Sails), and machining firms (Thermionics).



*Figure 5.4: Some examples of firm fission in marine trades firms*

The previous discussion suggested that no single lead firm played a dominant role in early cluster formation. My interviews do tend to suggest, however, that key firms appear to account for a disproportional share of break-away startups. As shown in *figure 5.4*, Port Townsend Boatworks and Admiral Marine appear to have played a significant role, in developing workers who later separated to form significant firms in the area. Both of these firms appear to be characterized by capable craftsmen whose business decisions led to episodes of distress within the firms. In the case of Admiral (a large-yacht manufacturer), my informants indicated a tendency of the firm to fluctuate dramatically up and down in employment size depending on contracts. In the case of Port Townsend Boatworks, proprietor Mark Burn was noted by many (including himself) as a better craftsman than manager.

Periodic layoffs are not the common denominator here. In these and other examples, the entrepreneurs proved unable to fully utilize the skills they had developed in their workers.<sup>54</sup> Hence, it appears that the firms did not spin off new enterprises as transactionally linked firms, as Scott and Storper have theorized. Nor does it appear that contingent workforce practices are the rule. Rather, new enterprises appear to have come about because workers develop skills are not fully utilized within the firm. This conforms to Appold's (1998) theorization that spin-offs arise from what he called "permanently failing" firms.

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<sup>54</sup> Relations between the parent and spin-off firms were typically noted as competitive by my informants. Some tensions were evident about the head-to-head nature of the competition. Statements about the desirability of keeping good relations were common. Joint efforts to bid for scale were mentioned as occasional events between parent and spin-off firms, but the main tendency was to develop complementary skills.

Firm fission appears to have played a central role in the early proliferation of marine trades firms, but other processes can be identified as well, and these bear on both proliferation of the core and the thickening of the district in ancillary goods and services providers. Cases of recruitment and relocation of firms from other locations (most commonly the Seattle metro area) have already been identified. More generally, the community continued to develop as a magnet for talented crafts-people.

Another institution was formed early in this phase of the district's development: Northwest School for Wooden Boatbuilding. This school was formed through the efforts of wooden boat community under the auspices of the Wooden Boat Foundation. Essentially, the group recruited instructor William H. Prothers from the Seattle area, and he started the school. While the early history of the school's operations are sketchy, it is a thriving institution today. The school employs seven people, and draws most of its course instructors from the local marine trades community. Students come to the school from national and international locations. Most students do not remain in the area, nor even stay in the boat building business, but some do enter the industry in Port Townsend, and area businesses consistently note it both as a source of talent and a location advantage of the area.

The development of the school both reflected and reinforced the market gravity that Port Townsend had, even by 1981, come to exert. The school was recruited to the area, and in turn attracted students from national and international locations. This institution, like the others, is neither a fleeting nor happenstance feature of the district, but was a product of early and consistent efforts by entrepreneurs to build a craft



community. The practice by the school of using skilled local workers to teach in the school indicates community engagement, and fosters direct employment linkages between the school and the local industry.

The account of cluster formation so far has covered two developmental moments: location and proliferation. What differentiates this center from similar locations where marine trades are present but not concentrated? Although comparative evidence was not gathered from alternative locations, some features of the local situation can be identified as central, and these are quite similar to the previous case.

First, it is clear that early entrepreneurs in the area had in mind a *conscious revival of craft*. The traditional boat builders in Port Townsend shared a particular idea for organizing an industrial community. Moreover, their concept appeared to reflect a classical location logic that recognized transportation cost advantages of Port Townsend, as well as the *zeitgeist* of counterurban and back-to-the-land appeal of traditional boat building in Port Townsend. In other words, the cluster was developed by the shrewd and purposeful action of community-minded entrepreneurs.

The *technological innovations* of the cluster, paradoxically, concern the revival of old crafts of wooden boat building. That revival appears to have had two primary effects on the development of the cluster. First, the local wooden boat building movement was closely associated by my informants with the emergence of a community concept entailing the organization of marine trades work along district lines. Second, the development of two institutions, the foundation and school, were primary extensions of

the idea of establishing the area as a center for wooden boat craft, and these successfully broadcast the area as a center for marine trades learning and production.

*Variety* in the types of producers was evident from the earliest stages of cluster formation. The presence of both the craft oriented wooden boatwrights and more industrial ship builders provided a broad scope of production from the start. This broad scope enhanced both the realm of contracting opportunities and encouraged greater local awareness of opportunities for diversification and development within the marine trades complex. It is notable that the proliferation of firms working in wooden, commercial boats has tended to blur the distinctions between the craft and industrial producers.

Notwithstanding the early recruitment of some significant firms and people to the area, the proliferation of firms appears to be significantly attributable to the *splitting off of workers* into new firms. The lineage among firms seems likely to have reinforced community norms of organization and exchange. These norms include supporting the marine trades community via involvement in local institutions, a general preference for routine contracting and free flow of information, and strong pressure on contractors to do high quality work.

Finally, *flexible contracting and ready referrals of work* among local firms reinforced low barriers to entry and permitted relatively young and small firms to deliver a competitive scope of services. Internal contracting appears to have been common from the early stages of cluster development, and small firms took full advantage this to win contracts. Moreover, practices of referring slack work to peer firms reinforced norms of exchange. The impulse of some local firms to internalize and integrate production

appears as an abiding theme of the district, but instances of *successful* integration appear to be quite limited.

The third moment of location – thickening of the area industry and the expansion of ancillary goods and services producers – appears to overlap significantly with the process of firm proliferation just described. In the following paragraphs, I examine instances of thickening that can be placed in the period from 1984 to 1989.

Edensaw Woods formed in Port Townsend in 1984 as a supplier of specialty woods to the marine trades industry, and has become significant exporter of marine and other specialty woods to regional and national markets. Its owner told me that the firm was established largely on the basis of diminishing local supplies of marine-quality timber. Edensaw replaced local with imported wood materials, and grew as a supplier of woods to distant markets and to specialty cabinet shops. In this respect, Edensaw follows the pattern observed in the previous case, in which local purchases were instrumental early, but local markets proved insufficient to sustain the firm. Edensaw quickly developed a regional and national sales range. In 1997, the firm reported that sales to the marine trades cluster accounted for only about 30 percent of the firm's sales.

Chandlery, which entails supply of marine hardware, presents another example of growth in ancillary goods. The Port Townsend marine trades directory lists four chandlery suppliers, all but one of which is a wholly-owned function of a local shipwright. My informants suggested that the local availability of marine hardware had improved significantly, but that proximity to specialty suppliers in Seattle continued to be

an important source, and this proximity was commonly noted as a location advantage of the Port Townsend area.

Professional marine trades services include surveying and design capacities, as well as moorage and detailing firms. Other supporting goods producers that appear to have emerged in this phase of development including firms engaged in machining and foundry, engine, canvas, and hydraulics work.

Pygmy Kayak, a manufacturer of kits for wooden kayaks, was established in Seattle in 1986, and relocated to Port Townsend in 1987. The disassembled nature of the product makes it amenable to national exporting, and the firm reported sales in national markets, which is unusual in the area industry. The firm reports another type of technical innovation, in developing software for computer aided design and production of hulls. The software is used by this firm and some other large producers in the area, as well as others nationally. (Interestingly, this firm is the only production-line firm identified in my interviews.) The firm's distinctive product and technical innovations reflect and reinforce its general impulse to standardize and internalize production and marketing functions. That general impulse is shared, though much less successfully realized, by such prominent local boat builders as Skookum and Admiral Marine.

One of the most intriguing aspects of diversification within the area industry is found in the growth of specialty machining firms in the local area. My informants included two machining firms that served marine trades purchasers (one as a freestanding independent, the other as part of a broader ship building firm) and two that produce components for scientific equipment (e.g., supercolliders). Those informants identified

six local firms that specialized in machine work, and estimated that (in 1998) about 30 skilled machinists worked in Port Townsend.

The extent to which the development of the machining industry can be attributed to the development of the marine trades district is unclear. We can say, however, that some machine manufacturing firms work in marine trades specifically, so are linked to it; that the industry appears oriented to craft production of specialized products; that variety of products and markets is evident, suggesting a diverse scope of work; and that firms appear to be proliferating in much the same way as has been observed in the marine trades and log home clusters. These things suggest that district effects may be evident in machining in Port Townsend. The observation highlights the possibility that features of the local area promote development of districts, or less broadly, that contracting relations within districts may help foment other districts.

Thickening in the area industry provides evidence of growth and diversification, and is one measure of district functioning. The development of local goods and services suppliers does not displace the tendency of many producers to shop at the regional scale for many goods and services. Regional purchasing was reported by shipwrights in wood products and chandlery, but it appears to be especially important in more basic areas, such as finance. Moreover, the tendency of diversifying firms to start up on the strength of local markets, but expand and grow on their capacity to develop their own outside markets is a consistent theme of the cases.

The development of ancillary producers, suppliers, and service providers are one benchmark of the third moment of district formation (agglomeration). Other features

may be identified as well, such as the development of skilled local labor pool, and “industrial atmosphere” such as norms, skills, knowledge, and information. The development of a skilled labor force was observed, for instance, in informants’ comments about the advantages gained from the school for Northwest School for Wooden Boatbuilding. The school attracts students from national and international locations, some of whom are absorbed as workers into the area economy; the involvement of local producers as teachers in school provides a close linkage to the labor market. Another landmark of a concentrated workforce advantage may be observed in reports of larger boat building firms, which amassed a labor force of over 100 needed to produce large scale ships. Admiral Marine, which moved a large part of its operations to Port Angeles in 1988, was reported to have hired many of its workers in Port Townsend and even arranged for commuter busses between Port Townsend and Port Angeles. No firms identified a shortage of skilled workers as a significant business obstacle.

Relatively good wage rates could also suggest a concentration of demand for specialized workers. The evidence from these interviews is relatively weak on this score, due in part to my decision not to seek interviews among shipwrights in comparable communities to Port Townsend. It appears that wages for shipwrights in Port Townsend are in the \$12 to 18 per hour, with billed rates about double to three times that amount. These rates were reported to be somewhat less than comparable shipyards in the Seattle metro area, but were sufficiently high to attract and retain a significant workforce.

The evidence for free flow of knowledge and information is similarly limited by a lack of control evidence, but the reports of my informants indicate a solid understanding

both of outside markets and of local capacities. For instance, even ancillary producers appeared knowledgeable of the condition of various fisheries as those influenced the both the nature and capacity of fishers to have boat work done. Although firms had different tactical responses to it, most gave a similar assessment of the market dynamics and tensions between recreational and industrial boats, and the challenges of firm positioning to work on larger or smaller boats. Common understandings about the general nature and direction of change in the industry were more than a subject of idle conversation; investment decisions by the Port (whose board of directors is largely made up of industry members) had bearing upon the future development trajectory of the district as a whole, a subject to which I shall return. Finally, assurances of confidentiality consistently elicited the reply that “there are no secrets around here.” The responses along this line were strikingly similar to statements given by log home manufacturers of the Bitterroot Valley.

The proposition that conditions of crisis and instability propel adaptation, limit the possibilities for internalization of production, and so intensify the benefits of district proximity has been raised by Schmitz (1990, 1995). In examining responses to crisis, I look to product, process, and market development, as well as changes in contracting behavior reported by informants. Broadly, informants noted these crises: (1) sustained restructuring of markets, including limited demand for new, small fishing boats and episodes of crisis in segments of the fishing industry (diffuse and unstable demand); and (2) wood shortages characterized by declining local sources of marine quality timber (changing supply conditions).

Shortly after the formative period of the Port Townsend marine trades cluster, the fishing industry turned toward big boats. The dominant feature of new commercial fishing ships was the rise of “factory” fishing vessels, the size of which were well above the capacity of the haul-out infrastructure of the Port. As has been noted previously, my informants reported that difficult conditions in some fisheries combined with high interest rates in the period around 1980 dealt a killing blow to Skookum Marine, which had developed a standard line of fishing boats targeting a niche market that was hit hard by restructuring. The failure of Skookum stands as a signal event in the early development of the cluster and marks a period when many informants noted market re-orientation and increasing management professionalism.

Three gross tactical changes are evident in this period from the reports of my informants. First, boat builders report shifting their production focus away from the production of new boats and toward the repairing division of the industry. The national statistics suggest that this was a shrewd change. In Washington, the ship repair division saw the strongest growth of any of the industry divisions, and the state gained both a positive national trend and from regional shifts toward the state (see *table 5.1*). Moreover, ship repairing appears to be quite profitable; this division has the average highest wages and value added ratios of any of the industry divisions. We cannot tell from national statistics whether the Port Townsend cluster had a leading influence in increasing the state’s share of regional boat repair markets. The notion is, however, consistent with reports of my informants, who maintained that Port Townsend quickly established itself as a center for boat work in a regional market ranging from northern California to Alaska.



The second tactical response can be observed in break-away boat building firms, which have been documented above and were reported beginning in this period.

Incidents of firm fission can be interpreted along the lines of Scott and Storper's (1987) theorization, as tactical shift toward vertical disintegration and social divisions of labor among firms. The shift toward many smaller firms marks a break from the Skookum strategy of internalization and up-scale production. What does not square Scott and Storper's theorization is that instances of firm fission were not instigated as a matter of executive strategy, but rather by skilled workers who took a chance to do business for themselves. One long-time boat builder commented:

I think it is just the way that it has evolved. When somebody comes to work for a firm, and they learn a skill and become highly competent at it, there is a point there where they either have to be satisfied with doing that for years and years, or move on to their own business. It is just a natural process. That happens by just being in a businesses of this type. The community has been identified as a place to come to for that kind of work.

Neither management fiat nor transactional linkages with the upstarts appears to have been a factor in breakaway start ups noted in this period. Rather, the new firms appear to have established themselves as rival producers who contracted fluidly with others in the area and, in time, developed relations with the parent firm on a footing as peers. The effect, however, is precisely as Scott and Storper describe it; an evolutionary shift in the trajectory of the budding district toward from internalization and firm growth, toward many smaller producers competing on high skill and capacity to customize production using fluid contracting relations.

The third tactical response is kindred, but bears specifically on changes in orientation by managers of industrial ship building firms. Informant comments support the conclusion that, prior to this crisis, the formative cluster was characterized by two camps, one devoted to the artisanal craft of wooden boats and the other oriented to the production, at scale, of commercial ships. The experience of Skookum highlighted the hazards of managing for integration and firm growth in the volatile fishing ship building industry and made plain the need for a different approach. Managers did not have to look far to find an alternative way to organize, it was present in the skills and mentality of the wooden boat community. Industrial managers appear, in this period, to have integrated themselves into the Port Townsend boat building community and developed an abiding cautiousness toward the tactics of internalization. As a practical matter, this entailed the use of contracting.

A fourth tactical response to sustained restructuring in commercial fishing entailed the development by the Port of Port Townsend of the heavy boat haul-out, which made it possible for firms, and the district as a whole, to compete in the realm of building and repair of ships of up to 300 tons (about 115 feet). That infrastructure was anticipated to usher in a substantial shift in the market orientation of the Port, and the district as a whole, and as such was highly political. It is discussed in a following section.

It is possible that I have made too much of the failure of Skookum as a watershed event. Stress and instability in demand for commercial boats has been an abiding feature of the industrial boat markets, and this has shaped and constrained the opportunity set of producers in the Port Townsend marine trades district. This closure was, however,

mentioned consistently by my informants, and the period was also associated with managerial growth and attitudinal shift from the Port Townsend cluster as a personal and communitarian cause to a professional and managerial system.

Before this period, the cluster appears to have been bifurcated into craft and industrial camps, the dreamers and the schemers, whereas afterward appears to have developed more as a single unified district.<sup>55</sup> It seems fair to say that the adoption by industrial managers of practices of contracting and information marks the emergence of a single dominant regulatory framework in the district. As a result, the richness of contracting opportunities compounded, and the opportunities for new firm formations increased. I suggest that significant features of district functioning can be placed in this period, five years (more or less) after the first acceleration of the cluster. I further find that the maturation of some district functions can be seen as a response to crisis in downstream markets that highlighted the limitations integration and necessitated an alternative approach to management.

Another of the shocks identified by my informants is the declining availability of marine timber from local forests. The availability of primary wood products from forests of the Olympic Peninsula was noted by my informants as a significant early advantage of the location. Even before 1990, however, supplies of old growth timber became increasingly rare.

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<sup>55</sup> The language of a community bifurcated into craft and industrial camps persists today. The tension between these camps appears to wane in stable times and grow in periods of crisis. A resurgence of the tension is associated with the debate over the Port's heavy haul-out, which is discussed below.

Two main responses were observed. Some, especially larger, producers buy their wood products retail, and mainly from the local supplier Edensaw Woods, as has been discussed previously. Many small and mid-sized shipwrights reported maintaining their own capacity to get marine timber for hull and deck planking from regional forests. Purchasing practices are, in this regard, very comparable to the reports of log home manufacturers outlined in the previous case. Boat builders who buy from local forests are careful to maintain good personal relations with their suppliers (small mills and custom loggers), look to more distant sources (including British Columbia) for wood, and are careful to pay suppliers well and on time. While wood inputs are a critical, the scale wood input needs is relatively small, especially compared to log home manufacturers.

Any difficulties getting adequate wood input supplies appears to have been overcome rather readily within the district. No respondents reported significant hardship as a result of material shortages, although some noted that the price of wood inputs was significant. The capacity of the district to respond to this crisis can be taken as a modest indication that the location value of the district had largely outgrown this physical advantage of natural resource accessibility.

Other significant changes within the district were identified as shocks by my informants. Among them were the rise and fall of other larger scale enterprises; and the relocation to Port Angeles by Admiral Marine of most of its production activities. These events, while no less significant, appear to reflect conditions of maturation internal to the district itself, and will be taken up below, under the heading of mechanisms of district development.

### *Mechanisms of district development*

This section considers how the evidence presented so far compares with prior expectations about the sequence of cluster formation. The notion that localized transactions generate industrial districts is largely contradicted by the evidence that institutions and collective practices had a significant prior presence in this case. Flexible contracting appears to have emerged following crisis in external markets and resulting management reorientation of industrial producers. I have suggested that the reorientation of industrial producers was coupled with the emergence of common regulatory modes and methods of operation, district-wide. Hence the transactional account is supported as a factor that contributed, perhaps decisively, to district development, but not as a primary instigating condition as has been specified in the scholarship of the California school.

Rosenfeld's contention that clusters precede the development of district attributes is supported in this case. Port Townsend had a long history as a location for marine trades. Although the vitality of the industry there had waxed and waned over the decades, in the middle years of the 1970s, there was an established and rather diverse core of producers doing boat work in the area. At that time, the area-industry had an established location value. This observation would support the idea that clusters come first. It also supports the kindred idea that prior location value is a precondition to district development.

But a clarification is in order. The group of firms in place in the mid-1970s was not an atomistic group of rigorous independents. It seems clear from the evidence that the small circle of existing businesses consciously set out to produce a district, of sorts.

The community of early marine trades producers in Port Townsend banded together to create and run institutions, develop working space, and recruit new entrants. All these activities were intended to increase the ground rent for the industry, that is, to develop the location value of Port Townsend.

By the time firm fission and diffuse contracting practices had become common, the industrial community had developed sufficiently to present struggling firms with a district alternative to the regulatory model of industrial internalization and firm-growth. I conclude that the seeds of district functioning were sown long before. This is consistent with the interpretation of districts as one expression of innovative milieu propounded by the GREMI school.

These same observations speak to the expectation that districts form in a rough sequence of location, externalization, and agglomeration. In both cases, I noted features of the initial cadre of firms that had lasting influence on the form of subsequent development. In both, certain agglomeration benefits were contemplated by the founding members. Those continued to develop as the clusters proliferated and thickened, but it must be noted that the benefits of agglomeration were noted and cultivated by producers early on, as a way to leverage the location value, or ground rent, on which the districts formed. It is a finding that supports policy-oriented analysts who have pondered how to foment districts among existing clusters of kindred, but atomistic producers.

A second clarification is in order. In this case, conditions of externalization, which favor the general growth of industries, were present in the form of general growth

of Washington's ship and boat building industries. The growth of the industry generally set the stage for the industry to grow locally.

I argued above, however, that conditions of crisis in the form of restructuring in markets for fishing boats rose up as a barrier to internalization and standardization of production within larger firms. The upshot was that commercial boat manufacturers turned instead to the district mode of management, i.e., a local regime of flexible specialization. In the former case, most log home manufacturers appeared to be limited in size by internal management diseconomies, embodied in difficulties keeping craft workers and competition among rivals within the district. In this case, we find some local limitations – e.g., Port facilities too small to accommodate larger ship building – but the main limitations were external features of the marketplace, which enabled many smaller firms to thrive where fewer larger ones might well have failed. Crisis in the marketplace caused some to firms fail, others to form, and still others to shift tactics mid-stream.

This is a more particular condition than is typically referred to under the broad rubric of external economies. In this regard, Scott and Storper (1987) appear to have gotten it right: shifts to externalization of production and social divisions of labor arise out of a variety of conditions, both external and internal, that favor smaller firms over large ones.

#### **Collaborative efficiencies and joint action**

In the marine trades district of Port Townsend, contracting and institutional activities are common and may alone account for the development of a small firm

district. Agglomeration effects (i.e., a skilled labor force, thickening, and social divisions of labor) developed remarkably quickly. In the log home case, I found that aid given to new start-ups, peer circles, and similar mechanisms stimulated district effects in the *absence* of routine contracting and formal, joint action. Norms and habits of reciprocity, backed by a common awareness of the community as a source of competitive advantage, affected district development. These things are present in Port Townsend too, and may account for the speed and nature of the district's development. This observation underscores the idea that collaborative efficiencies are not limited to matters of market exchange and formal institutions, only their most concrete manifestations. In the following paragraphs, I describe the nature of contracting relations.

Trade is common among firms of the Port Townsend marine trades district. Large and medium sized boat building firms, especially, rely on contracting to enlarge the scope of their services. One informant (who noted, "We try to offer everything.") reported always subcontracting for hydraulics, rigging, canvas, sandblasting, machining, and other specialties. In general, such firms internalize as many functions as possible, but the extent to which that is possible is limited. Many types specialties have a discrete task or stage of work and cannot be steadily employed by the internal market of a small firm. The flow of work and, more critically, the nature of the jobs are highly variable. Flexible contracting gives the district an unusual capacity to sustain multiple firms offering full service boat building and repair.<sup>56</sup>

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<sup>56</sup> One informant noted that Port Townsend is one of two locations on the West Coast where complete marine services are offered by more than one firm.



Large and medium-sized firms function as market makers for many specialty trades in the district, but they do not appear to exert dominance of market or technological leadership. With rare exceptions (see the discussion of Admiral Marine below) the market and technology capabilities of the core boat building firms are interchangeable. As a result, the competition among these firms can be significant. The transition of some proprietors out of general boat building services reflects the search for niches that reduce or eliminate head-to-head competition. One informant noted:

Competition is an issue, personal fulfillment is an issue but it is also a very difficult business. Financially it is quite finite. You can't charge more than the established market prices, but at the same time it is extremely demanding. You have to offer welders, fiberglass people, electricians, mechanical people, machinists, all of the trades must be brought together under tight time constraints. As problems surface, things have to be worked out almost instantly. The work, at least at the level that we were doing it, is very technical. It takes a lot of engineering skill....

As a Boatyard, there would be intense competition. We didn't collaborate.... We did use the same subcontractors, maybe somebody that specialized in painting or wiring. There were times when customers by, choice, would come in and say, you are good at that, and you are good at that, I am going to hire you to do that, and you to do that. That would happen, and then you would have to mesh with it. We did bid on a job with \_\_\_, didn't get it though. We did things like, we got these jobs and we gave it up and hired \_\_\_ to do the painting. So we contracted for specialized things like that ....

[In new marine trades niche:] We can have a complementary relationship with different companies here... get maybe one-third of an overall project. A boat will come in and ... while we are doing that there is something else going on. Just as an example we just did a project ... our system was about \$18,000 and I would imagine the customer spent another \$50 or 60,000 in other work.

Contracting among smaller and more specialized producers is also common, though it is less routine and more varied in its nature. The variability in contracting practices mostly appears to be attributable to the different nature of the specialties. For instance, a *sail maker* works mostly under direct contract with the purchaser, but may also subcontract work in the district, and may contract out some canvas work. *Machining* firms work mainly on a subcontract basis, although I have noted that some significant firms produce directly for purchasers in other industries. Some specialists (e.g., in rigging) take on ship repair work on the strength of their general skills, and contract with others for needed work.

*Surveyors* (a marine appraisal specialty) assess what work is needed and often determine what firms are available and qualified to complete needed work. In that role, surveying firms may effectively broker contracts among firms. They also contract for specialized expertise. One surveyor noted: "We are working in an age when information is neither expensive nor hard to come by. We are able to, and often do, go out into the community to assemble teams to get the technical knowledge and experience we don't have."

Certain practices noted in the log home case are also observed here. First, although firms report stiff competition to get contracts, they readily refer surplus work to one another. This reflects general awareness of capabilities and slack capacity among peer circles. Firms' reliance on referrals was consistently noted as a means of enforcing the district's reputation for high quality work. One informant noted this unwritten rule: "Foul up twice, and you don't get work."

Second, there was a tendency among my informants to discount, but then affirm, the role of horizontal contracting. In most references to it, horizontal contracting (i.e., among similar, competing firms) appears to reflect capacity problems of the primary contractor, but some reported joint proposals to achieve the scale needed for a successful bid. Comments along this line reflected a willingness to experiment with different contracting relationships, even the desire for a consortium-style of contracting. The following comment is representative of statements by three well-established players in the district:

There might be a change in the model, for almost an administrative firm – and in some cases we have taken that role to a certain extent. When somebody wants [something we do provide] that requires all this other work that we don't provide, we have gone to the community to get the resources together to do it and talk about who all is going together to do it. That may take place more and more.

Finally, the general tendency of people to seek out complementary roles as a means of limiting direct competition is evident in the thickening and diversification of firms within the district. Examples include the development of fine niche specialties,

technical innovations, and product exporters (e.g., yachts, refrigeration systems, specialty woods, machinists, kayaks, sails and canvas products). Surely, niche seeking is not unique to districts, but it would appear that the incidence of diversifying specialization is enhanced by the information, workforce, and internal market advantages of the agglomeration.

### **Admiral's expansion, the Port's heavy haul-out, and the "tailgaters"**

The marine trades district of Port Townsend conforms to many of the general expectations for district functioning outlined in the classical literature on Italian industrial districts. Contracting, and institutional practices enhance firms' production scope, foster diversification, and reduce barriers to entry to new firms. The district has generated a large and diverse concentration of skills. Instances of collaboration and free flow of information and referrals are easily found.

The district's functioning is not, however, a placid thing, and relations among firms often involves rivalry and conflict. Firms rise and fall. Bidding often involves intense competition. Participants have different ideas about what the district is and what it should become. These conflicts play out in the public realm of local institutions. One illustration of this involves the expansion of Admiral Marine, the development by the Port of the heavy haul-out, and the "tailgaters."

Since Skookum's failure, other firms have attempted, with mixed success, to grow to significant size within the district. The most prominent is Admiral Marine. The firm had relocated its operations from Seattle to Port Townsend in 1978, when it was a three person shop consisting of a father and two sons. Over the years, the business grew

steadily as a builder of fiberglass-hulled recreational boats. By the mid-1990s, Admiral had emerged as a manufacturer of world-class yachts, sized up to 150 feet. In the process, Admiral had developed to a point where it served a market, and bid against rivals, at the global scale.

During one recent peak, Admiral employed about 150 people, most of whom were devoted the production of a single ship, which accounts for the majority of boat building employment in the district. One of the abiding challenges of yacht production at this scale is the difficulty managing demand needed to keep the internal workforce steadily employed. Some demand smoothing was achieved through diversifying investments. The firm maintained ship repair facilities and also ventured into aerospace composite production and retail chandlery. In large part, however, the firm relied on contingent labor practices, hiring and firing specialists and laborers as demanded by yacht contracts.

While Admiral appears to have internalized much of its production labor, it was also a source of contract work for firms in the Port Townsend marine trades district. The firm's contracting practices opened to Port Townsend's marine trades firms a realm of markets that was not otherwise accessible to them. This was enabled, in part, by the firm's leadership in management, marketing, and technology. No informants, however, reported relying on contracts from Admiral for a dominant share of business. One mid-sized firm reported that up to 20 percent of its income in one year had come from Admiral subcontracting. Admiral's role as a contractor was significant, but by no means controlling, within the district.

In 1997, Admiral moved the majority of its operations again, this time out of Port Townsend to the nearby community of Port Angeles. There, the firm set up production facilities at a waterfront location, where it built a boat lift large enough to move its large yachts to water, and at an airport location, where the firm's offices, design, autoclave, cabinet and wood joinery shop, and hull fabrication facilities were situated. The move was supported by financial incentives from economic development agents in Port Angeles.

Admiral's departure was expected to be a setback from which the district would recover. Some informants noted Admiral as an "anchor firm," the absence of which would slow the realization of benefits from the heavy haul-out, which was completed in 1998. Most, however, expected that one or more firms would develop a leadership position. Moreover, Admiral's efforts to break free of the agglomeration benefits of the Port Townsend district were partial. While Admiral's contracting to firms within the district declined, the firm continued to use skilled laborers who commuted from the community.

Admiral's key problems in Port Townsend were not principally matters of labor organization, but rather the physical and infrastructure limitations of the Port facilities themselves. Earl Wakefield, Admiral's founder, reported that, as ship size increased, the need became more pressing to develop larger space and to improve capacity to move ships from dry dock to launch. For years, Admiral had urged the Port of Port Townsend to develop a heavy boat haul-out.

The development of the heavy haul-out was reported as a difficult and controversial project that took years to bring to fruition. Construction of the facility was widely expected to improve the district's capacity to work on larger boats, and so would enable Port Townsend marine trades firms to participate in growing markets for large ship building and repair. Because of the limited size of the Port shipyards, however, the heavy haul-out was also expected to have an adverse effect on smaller projects and operators. These concerns were particularly acute among the "tailgaters."

The tailgaters are a diverse lot of independent operators who include boat builders as well as specialists in such marine trades crafts as rigging, interior finishing, cabinetry, hydraulics, sandblasting, canvas work, and machining. Characteristically, tailgaters are mobile operators who have minimal investment in shop and office. Among them are some of the most highly skilled crafts-people in the district, as well as some newer entrants.

One source estimated the number of tailgaters number at 33, but the population is hard to pin down. Many tailgaters are itinerant in the place and/or industry. Some fish seasonally or do construction work. Others reported traveling to do boat work in other (often international and exotic) locations. Some work simultaneously in different industries, such as construction, taking work where it comes.

Tailgaters were noted by informants as a source of contingent labor in the district. They are typically cheaper than mainstream businesses and often contract work from firms in the district. Tailgaters also compete directly against firms that are more heavily invested. They draw criticism from some such firms, who see them as not paying their

share in rent, undercutting prices, avoiding required environmental practices, and working too slowly or unreliably.

In the classic description, tailgaters work with boat owners directly, especially wooden boat owners, where opportunities are maximized for owners to work alongside craftsmen. For many in the district, especially the tailgaters, this is what works best about Port Townsend: skilled trades-people working in casual conditions directly with boat owners. It is a happy arrangement that sustains both the boats and the crafts. To clear the decks for large ships, they felt, would harm the district by upsetting its ecology, with its incredible skills, boats, and surroundings.

The conflict over the Port's heavy haul-out inflamed the old tension between the commercial ship builders, with their larger scale and greater professionalism, and the wooden boat enthusiasts, with their traditional boats and organization. It appears that the tailgaters' problems were not limited to concerns over the heavy haul-out. With development, the Port had come under increased pressure to improve environmental practices of the boat builders, which is more readily done by firms with fixed locations. Additionally, population growth in Port Townsend has been associated with an inflation of property values, which falls hardest on itinerant residents.

The heavy haul-out was widely expected to harm Port Townsend's tailgaters. The outlook for most other types of firms was more optimistic. In general, the haul-out was expected to bring larger commercial ships to the Port, increase the need for environmentally cleaner and visually tidier operations, place additional management demands on many businesses. As has been noted, several informants anticipated the need



for higher levels of interaction and coordination among contractors. Interestingly, however, none of my informants expected that the new development would lead to a widespread integration and consolidation of firms.

As an afterward, I can report observations from a brief follow up visit to the community, in the summer of 2000. (County Business Patterns data for 1999 shows that the boat building employment in Jefferson County declined to about 70 in that year.) I found Admiral's old space, the largest facility in the Port of Port Townsend occupied by a new yacht manufacturer. Conversations with my informants suggested that the new firm was established by a break-away group of designers from Admiral who, with financial backing from international shipyards, were managing the facility as a consortium. The facility was reported to be generating substantial contracting work within the district. A significant increase in activity in the shipyards was evident. Several new shelters covering projects in progress were observable in the main Port area. Both its appearance and comments of my informants suggested that the district is busier than ever.

## **Chapter 6: Conclusions**

This dissertation has presented a review of the literature on industrial districts and an analysis of two cases. Both cases involved young districts composed mainly of small manufacturing firms in the non-metropolitan Northwest. The study has dealt with three main themes of investigation: (1) development sequences; (2) the conditions and mechanisms of agglomeration; and (3) motive forces of district formation. The field research highlighted attributes of small-firm, craft districts and yielded intensive, descriptive information about the attributes of such districts. We must be conscious of the limitations of the data: it neither reflects broad populations nor rigorously scores attributes on pre-cast measures. In general, the research generated descriptive field information spanning time, space, and industrial scope, and it produced rich information on basic questions about the nature of these districts. What remains is to address findings from the field research, theorize them, and consider implications for research and policy.

The case studies examined questions of district formation in some detail to add to the discourse about the external and internal conditions of agglomeration. I proposed conceptualizing district development in terms of a rough sequence of conditions: location, externalization, and agglomeration. These conditions were organizing themes in the assessment of district functioning that served as a research template for the cases.

This examination of two industrial districts informs questions about the formation and function of agglomeration effects in industrial districts, which were main themes of

the case studies. Questions in this realm address theoretical debates about whether districts arise from transactions (i.e., contracting and exchange) or more varied social effects. I considered how enhanced competitive capacity of one firm benefits others in the cluster. Under this banner, I asked if firm leadership, through technological innovations or market strength could explain the districts' development, or if dominance over workers was significant. I also asked how negative external economies affect cluster development, i.e., whether districts confer different capacity to respond to crisis. I asked how new firms arise, and what accounts for the emergence of new firms and specialties within the districts (i.e., thickening). I asked about the role of formal institutions in district formation.

*The conditions of agglomeration and the formation of districts*

The broad categories of location, externalization, and agglomeration served quite well as an approach to cluster description. Table 6.1 outlines some of the major attributes of the present cases and is provided here as a general reference. I will not reiterate these attributes under their own heading, but incorporate observations into the following discussion and conclusions.

In describing location attributes, I considered the prior situation of factors such as resource inputs, labor conditions, purchaser market conditions, and urban proximity at early moments of district formation. In the early 1970s, both areas had a remarkable market centrality in their industries. That is confirmed by informant reports about the historic presence of the industry and the area's input-output centrality, supporting the conclusion that classical factors of market centrality were common conditions of district

formation. In these cases, location advantages did not remain external, uncontrollable forces. As these clusters emerged, the intents and actions of the actors quickly reinforced favorable location values and ratcheted them up. As Weber described it, the social nature of production appears to have driven subsequent agglomeration and exerted circular effects on subsequent development.

The second condition of district formation concerns external economies that drive industry growth and shape conditions of internalization and externalization of work by firms. The economic figures and informant comments suggest that early growth conditions were favorable. The proliferation of firms and emergence of the clusters came at a time when good demand created ample opportunities for growth. Both industries have downstream markets characterized by diffuse and independent purchasers (rather than organized hierarchies), and this appears to have favored early growth in establishments. We can speculate that good times reduced social friction in the nascent districts by limiting the role of head-to-head competition among peers.

The third set of questions in the assessment of districts concerned agglomeration. Agglomeration effects include the exogenous (benefiting all firms, e.g., labor organization, infrastructure, thickening, and industrial atmosphere) and the collective (entailing joint action, e.g., contracting, cooperation, alliance, and institutions) effects. Since discussion about the nature and role of collective efficiencies has been so central to recent theoretical debates, I reserve the discussion of mechanisms of agglomeration to the following section.

Table 6.1: Key characteristics of the two cases

	<b>Log Homes</b>	<b>Marine Trades</b>
<b>Location</b>		
Resource availability	Reliance on regional forests Supply management	Regional forests (sunset) Chandlery & supply shops (metro and local)
Primary markets	Resort & amenity areas: CO, UT, ID, MT	Northwest coastal region Fishing & recreational boats
Labor organization	Craft and production line Internal scope of production A center for craft revival	Desirability of Port Townsend A center of craft revival High skill, lower cost labor
<b>Externalization</b>		
Market growth	Strong regional, national	Regional and niche
Technological change	Centralized hand building Latheing technology Craft revival	Craft revival Small firm networks Community institutions
Supply volatility	Escalating competition for logs Supply management is critical	Moderate
Demand volatility	Dependent on regional construction markets	Dependent on restructuring fishing industry
Product change	Specialization Product line expansion	Larger size More recreational
<b>Agglomeration</b>		
Labor market	Dense, high wage	Dense, moderate wage
Labor informalization	Minimal: Log Peelers	Seasonality & specialization: "Tailgaters"
Horizontal linkages	Demand stabilization Growth management Specialization in scope, market	Capacity Labor specialization
Infilling of subsidiary trades	Logs, Design, Components (rails & millwork)	Pervasive
Vertical linkages	Limited	Extensive
Marketing economies	Moderate – Extensive	Extensive formal institutions
Institutions & infrastructure	Limited	Extensive

### *On the formation and function of districts*

This dissertation has addressed a number of questions about exogenous effects, transactions, and other collective efficiencies to inform questions about how industrial districts work to create and propagate industrial advantages in relatively rural settings.

*What accounts for district formation?* There are two main currents of thought in the literature. The California school has held that transactions between firms are prior and primary in district development. By this view, market linkages and social divisions of labor between firms are the essence of externalization and the engine of district formation. A second, somewhat broader, view is that exogenous economies in the local markets combine with trade center functions to support district growth. The flexible specialization school presents a third interpretation, and the main alternative to the transactional thesis of the California school. The flexible specialization theory holds that districts are the cumulative effect of exogenous economies and collaborative efficiencies, that is, districts are products of a variety of institutional routines and social conventions and must be understood as an industrial community. By this view, contracting may arise early without being primary.

Some central ideas about the nature of collaboration are fuzzy: they are hard to see clearly except through the filter of known success. This same fuzziness afflicts Marshall's (1925) conception of exogenous economies. Exogenous economies are characteristics of an industry that take on the character of public goods, such as skilled labor pools, infrastructure, and "industrial atmosphere." (In conditions of externalization, norms, skills and knowledge of the industry can become free in the atmosphere of the district, public goods. In districts, information is "in the air," Marshall said. Or as Crevoisier (1996) put it, information in proximity is free, fast, and multiplex.)

In general, I found that the importance of contracting, infrastructure, and formal institutions varied between these cases, but it appears that exogenous economies were

common and ubiquitous. In both case studies, in a period of two to three years, the local industries grew from small initial circles of people to clusters of firms that had created local market advantages and organized small communities of skilled workers in a budding industrial system. Central players in the founding firms seem to have been smart, dynamic, and oriented to craft organization. In an interesting retro twist, informants in both cases associated an early proliferation of firms with the revival of a hand building craft, and key players carried forward this revival as a development vision. Skills and knowledge of the industries were transferred to new firms in a series of spin-offs, and industrial communities quickly developed.

The substantial role for entrepreneurial intention in the formation of these two districts is what surprised me most in the field research. Broadly, it can be said that these districts formed because of purposeful efforts by a few highly capable people to revive building crafts; to project their communities into regional markets for these crafts; and to generate benefits from agglomeration. Knowledge of production and markets, and norms of referral and exchange, appear to have been embedded in the settings as the clusters emerged. Districts were not necessarily the intent of the entrepreneurs involved in the early days of these local industries, but were *consistent with* their intent. This finding is at odds with the bulk of the literature from the flexible specialization and California schools.

The proliferation of log home manufacturers in the Bitterroot Valley, for example, can be traced to two main firms, whose innovations in log home production meshed with growth in regional markets. The spinning off of firms from these core producers appears

to have been seen as an inevitable consequence of the nature of their business, and this spinning off embraced as a local “revival of craft,” even in the absence of substantial need for linkages among firms. In the marine trades district of Port Townsend, too, the revival of craft was embraced by craft producers through both individual and institutional efforts. And in this case, too, early variety among a few early firms fostered competing modes of production (i.e., between manufacturers and crafters) that evolved through spin-offs and competition into a unique localized system of production.

The cases have several commonalities. Both were remarkably well located in their regional markets, and the districts’ development rode the growth of demand for their products. Favorable underlying conditions intersected with local innovations concerning the craft organization of the industry. In both cases, at least two dissimilar firms were in place prior to clustering, and these firms reflected variety in products and the organization of work. This variety appears to have influenced local evolutionary dynamics and added to market center effects. An awareness of external forces that favored general industry growth (externalization) over concentration (internalization) was embodied in purposeful efforts to foster localization of the industries.

*How do new firms arise?* Essential to district development is that, by whatever means, clusters of kindred and complementary firms arise. The major theoretical expectations are that new firms are: spun off as transactionally linked firms, attracted by more general market advantages, or attracted by still more general location advantages. A fourth possibility, raised by Appold (1998) is that firms proliferate because workers



acquire skills that are not used within the firm, and they simply leave, a situation he called “permanently failing firms.”

Outright *attraction* to the area contributed to cluster formation in one of the two cases. Some informants in Port Townsend recalled the period of firm proliferation as a romantic time of excitement and idealism about the creation of craft community, and both firms and individuals were identified to have located in the area on that basis. This attraction was encouraged outright through institutional efforts, such as the Wooden Boat Festival, and by individuals who recruited proprietors and teachers to the area.

In both cases, the *spinning off* of skilled workers into new firms was a common means of new firm formation that appeared especially important in the early period of district development. I have called this phenomenon *firm fission* in reference to cases of dissolution of partnerships, buyouts, and the exit of key workers to new or competing firms. Several examples of fission were reported in both cases, although they appeared most central to the early proliferation of firms in the Bitterroot Valley log home district.

I talked with some proprietors who had spun off workers. Their comments suggested that spinning off firms was an act of neither strategy nor altruism. These people would have preferred that their workers not become their competitors. The impulse of proprietors to accumulate benefits, however, proved unworkable. Markets were inconstant enough, and barriers to entry low enough that their firms split apart. This conforms to Appold’s description of permanently failing firms, but it also suggests that general conditions of externalization enable firm fission; it is not a tactical failure as Appold’s term might suggest. To the contrary, the proprietors appear to have been

pragmatic about the fission of their firms; there was no evidence of sanction and labor informalization on the part of such firms (as was suggested in similar circumstances by log home informants outside the Bitterroot Valley). Being unable to internalize and control the benefits of production expertise within the firm, key entrepreneurs in both cases appear to have encouraged the localization of benefits instead.

*What accounts for the emergence of specialized input-output functions?*

Alternative explanations for the development of ancillary goods and services providers, are similar to those reviewed in previous questions, concerning the transactional or exogenous basis for the emergence of subsidiary trades, or “thickening,” of districts.

I asked ancillary goods and services producers about their origins and linkages to the districts’ core producers. In Port Townsend, subsidiary trades were present at the time of cluster formation. Sailmakers, designers, and other specialists (including the Port and the Wooden Boat Foundation) joined shipwrights from the start. In both cases, however, as the districts gained momentum as market centers, outside firms located in the area, outside investors capitalized growth in production capacity, and the number and scope of input products and services proliferated. Periods of thickening were noted as a “coming of age” by informants in both cases. I conclude that two different agglomeration effects supported the industrial thickening of these districts, one exogenous and the other transactional. By the early 1980s, for instance, the Bitterroot Valley had begun to attract new business locations and financial investment on the strength of its reputation as a market center for log home manufacturing. At the same time, local producers encouraged the formation of specialized input suppliers, including door and cabinet

makers, chinking and finishing suppliers, designers and architects, and in some cases these firms were nurtured by unusual contracting arrangements. The net effect of these changes was to expand the scope of, and reinforce specialization within, the growing district.

*Market gravity* refers to the condition in which exogenous attributes of the industry attract purchasers and suppliers, supporting the progressive thickening of the local industry. The concentration of firms creates market center effects and encourages the location of ancillary goods and services. In essence, in the clustering period, firms in these cases built a good name for their areas and benefited from the resulting attraction of workers, purchasers, suppliers, and capital. This has been discussed previously, under the rubric of ground rent: the progressive development of a district ratchets up industry-specific location values, as evidenced in the attraction of new players to the districts. The case studies suggest that the ground rent of the districts rose in each identified moment of development. Informants in both cases identified a period of attraction and thickening (discussed in the case studies under the rubric of the second moment of district formation) that included the reorientation of urban and regional services to the districts, outright efforts to aid the local formation of new specialties, improved linkages to debt and equity finance, etc.

I borrow the idea of *adaptive radiation* from biogeography in reference to the tendency of exchange to foster complementarities between firms. Similar firms, in conditions of exchange, will develop product and market niches that tend to enlarge the scope of local activities. As head-to-head competition is supplemented by inter-firm

contracting, similarity gives way to complementarity, and competing producers verge toward interdependence. The process is comparable to speciation in evolutionary biology. As complementarity proves functional, small initial differences become magnified into distinctive means of survival. The implication is that exchange within districts is a mechanism supporting both specialization and diversification within the district.

The local context of variety and exchange within the two districts appears to have had a substantial influence on how firms organized initially and how they subsequently developed. Firms with rich communications and exchange will tend to find complementary roles and to progressively differentiate their product and market offerings. The secondary importance of contracting within the log home district, in particular, suggests that differentiation and niche seeking may arise from information and other exogenous advantages alone. In both cases, exchange of information and referrals appears to have fostered niche seeking and complementarities between firms, which further encouraged exchanges capitalizing on local scope and capacity. The ready flow of information, referrals, and contracting within districts support their specialization *and* diversification.

In the log home district of the Bitterroot Valley, the evolutionary analogy seems quite direct. In this case, the development by similar firms of niches in markets, material and design tended to reduce the friction of competition and enhance the scope of products and markets. Firms that began as similar contractors, competing head-to-head, developed their differences as distinctive means of survival. Some firms developed as leaders in

certain products (e.g., using large or long logs, doing large jobs, dovetail joints, etc.) and markets (e.g., relational ties to certain regions and building contractors). Younger firms and those less oriented to growth more often reported functioning as contractors and small job specialists. Similar effects appear to have been at work in the marine trades district of Port Townsend. In that case, I noted examples of diversification into altogether new products. Remarkable in that case were instances of diversification that overcame the heavy local reliance on regional markets by developing products that could be shipped.

*How does enhanced competitive capacity by one firm benefit others in the cluster?* The ability of one firm to produce new products or reach new markets may benefit others in a district by two main mechanisms: diffusion of information and exchange. Formal contracting is one type of exchange, which may be further classified into horizontal (i.e., contracting for scale) and vertical (i.e., scope); formal and informal; and hierarchical and peer relations. The literature has noted, for instance, cases where contracting is led by strong central firms, or relies heavily on casual labor and the informalization of work. This part addresses a number of questions concerning the nature of exchange and the social division of labor between firms.

The role of *contracting* was quite different between the cases. Informants in Port Townsend's marine trades district recalled a significant early role of referrals and exchange as enabling the growth of new firms. In this case, it appears that a common mode of entry for new firms is to contract for routine work, as vertical specialists within the district. Reliance on contracts and referrals wanes in importance as the firms develop

outside markets of their own. Reciprocity in contracting and referrals was a means of enforcing local norms of high quality work. The extent of contracting and referrals in Port Townsend, and its role in the vertical specialization of firms, supports the conclusion that this district functions under a classic small-firm flexible production model.

Direct contracting appeared to be considerably less prominent in the Bitterroot Valley log home district. In general, log home manufacturers in this case had a similar scope of production: they buy logs and sell home shells. Although there were some reports of early contracting for routine production and assembly, inter-firm divisions of labor appear to have been limited and, for the most part, have remained so. Exchange among peer log home manufacturers in this district appears to be mostly in the nature of personal favors, information, and referrals. Reports of exchange suggested that local firms commonly refer slack work to one another. This and other types of exchange helps peer firms manage difficulties in both input and output markets.

The need to quickly get certain types of logs is a common problem among log home producers. Being able to turn to their peers to “get some logs in a pinch” appears to be important enough that proprietors are careful to stay on good terms. Supply reciprocity, in this case, helps reinforce broader norms of competition and exchange. Moreover, in spite of the much more limited role of vertical linkages, firms sought out product and market niches. The log home producers became progressively different in terms of product and market specialties. Informant comments suggested that niche seeking was encouraged by the need to reduce head to head competition, but the progressive specialization of firms appears to have had a verticalizing effect on relations.

With development, vertical contracting appears to have become more common among log home manufacturers of this district.

One view of industrial districts (Amin and Thrift 1992) has contended that districts rely on the informalization of labor, a term that embodies a variety of practices including temporary and piece work, and contracting to sweatshop operators and “screwdriver plants” as a means of achieving low cost production. In essence, cheap and flexible labor subsidizes the competitive advantage of new regional agglomerations. Amin and Thrift have claimed that flexible labor may be particularly descriptive of rural districts, which they suggest arise in the devolution of production from urban centers for product cycle reasons. The product cycle hypothesis implies a broader question of motive forces, which will be considered later. What must be considered now is whether the labor informalization is central to these districts’ competitive advantage.

*Informal firms and workers* were notable in one of these cases. Norms in the log home industry of paying log peelers on a piece-work basis were the only substantial example of informalization noted in the Bitterroot Valley, and they appear to be of minor significance in understanding this district. In Port Townsend, however, the “tailgaters” (i.e., mobile operators) represented a whole cadre of firms that provided specialized production capacity cheaply and seasonally. Local tensions over the use of tailgaters, whose lack of a fixed location reduces their “shop rates,” suggest that tailgaters do tend to reinforce price competition. On the key issue of whether this district relies on informal work for its competitive advantage, it was be noted that several of the tailgaters are globetrotters who seasonally fish or do marine trades work in distant, often exotic ports.

My informants (which included tailgaters) suggested that these people work as they do out of a lifestyle choice, because it gives *them* flexibility. This is hardly consistent with a view of rural workers as cheap and pliable labor force and of rural districts as predicated on the flexibilization of labor.

Viewing the tailgaters in this way enables us to draw a parallel to the cadre of “satisfied” firms noted in the log home case. Such firms are analogous to what Birch (1987) and Taylor and Thrift (1983) call “laggards” and dismiss as economic impediments. The existence in both districts of satisfied firms appears to add an important dimension to the possibilities for exchange relations. Satisfied firms are less likely to seek out product innovations and market development, but commensurate with their skills, they are more likely to be favored as sources of slack production capacity. A weak orientation to growth may also make such producers apt confidantes and contribute exogenous effects by encouraging the exchange of information. (Trust has been called by Rosenfeld (1992, 1996) and other policy analysts a necessary condition of district development.) In the context of district relations, I conclude that laggards matter. Satisfied firms may play a substantial role in the formation and function of small-firm flexible production systems, not as informal laborers, but as lubricants of exchange and transaction.

*Is exchange marked by hierarchy or is it better described as peer relationships?*

The cases studied here do not appear to be integrated into global hierarchies, as Amin and Robins (1991) suggest they must be. This seems to be in the nature of the industries themselves, which are characterized by diffuse downstream markets. A related question



concerns whether power relations within the districts are central to their form and function. The case studies have noted significant differences in leadership, with different levels of innovation in product, market, and institutional risk taking. Firm leadership was noted in both cases, but not lasting dominance. I do not mean to suggest that efforts by individual firms to control and internalize the benefits of production are missing. Efforts by firms to internalize aspects of production are common, and in some instances have been successful. External conditions in the industries and exogenous attributes of these districts, however, appear to have discouraged the development of rigid lines of authority.

Although instances of internalization by firms within these districts certainly exist, these are not instances in which districts formed because central firms externalized production, nor even are the capacities of mainstay firms of overriding importance to getting work in the districts. It seems most accurate to say that the leading firms in these districts have been important sources of innovation, but that these firms have benefited in turn from the local exogenous and collaborative efficiencies of the district setting. The districts are much more readily understood as markets, or even communities, than they are as hierarchies. Virtually without exception, my informants reported routinely referring surplus demand to one another. The ordinariness of referrals within these districts is fascinating because it suggests the blending of community and economic relations is integral to these districts' functioning.

Firms in log home and marine trades districts studied do find it efficient to collaborate. All but a few largest and most isolated firms interviewed routinely exchange information and refer work to one another. They invest significant energy in staying on

good terms with their peers. These things conform to classic descriptions of collaborative efficiencies.

In both districts studied, my informants reported engaging in collaborative practices selectively and reciprocating differently. Nearly all those interviewed identified a circle of confidants and collaborators, and described common types of interaction with them, but the nature of collaboration differed significantly from one informant to the next. Moreover, when interviews were conducted within a circle of peers reported by one firm, those peers invariably reported a somewhat different peer group and relations. What appeared (when viewed as an industrial system) as a chaotic mélange of reports began to make sense when viewed as a community system of interlocking social relations, through which capacities are developed, norms imposed, and information diffused. I began to imagine the formative district as a tapestry in which friendship is the weft and rivalry the warp.

As this study progressed, I added *peer circles* to my thinking about district phenomena. I mean that term to refer to the set of firms between which relations are relatively open and reciprocal, as opposed to guarded and competitive. I do not mean to imply that these circles are formal and closed but quite the opposite. They appear to have more the character of friendships, rather than business arrangements and constitute zones of safety in which information and favors may be exchanged within a local context of competition and rivalry. Not only do the circles in these cases appear to be fluid and highly personal, but since one firm's circle intersects only partially with another's, they also tend to interlock.

The role of peer circles became evident in the case of the log home district of the Bitterroot Valley, where there were limited observations of thick and routine contracting among firms. In that case, contracting and collaboration within the context of peer circles honored developed niches, smoothed demand, nurtured new entrants, and limited the role of head-to-head contracting practices to mutual benefit. I conclude that peer circles may substitute for some functions often assigned in theory to both contracting and institutions: promoting the district in the broader market, lowering barriers to entry of new firms, and facilitating the flow of work and information.

It seems reasonable to suggest that the presence and pervasiveness of peer circles plays an important role in the development of new districts. Through the multiple circles that constitute an industry cluster, information is conveyed, factors are exchanged, and specialized product and market niches develop. Such outcomes appear to improve firms' ability to thrive in volatile conditions and permit higher risk taking than might be seen in more isolated settings.

I do not mean to suggest that peer circles are sufficient to explain district development. Not only were these types of relationships observed outside the log home district, but also some successful players within the district appear to hold themselves apart from these types of local relations. In conditions of agglomeration, however, the number of peer circles increases, their function becomes more diverse, and the substance of what is transacted becomes richer. Firms working through interlocking peer circles may, as a result, better anticipate changes in the external economy, and more readily experiment with adaptive responses. This finding augments Schmitz's (1995) insight that

districts help firms adapt to disruptive circumstances. It is also consistent with Malecki (1997), who points out that firms with an “extroverted personality” can succeed in isolation, but that an information rich (i.e., urban or district) environment helps firms to succeed more routinely.

The general nature of peer circles seems to be understood by the producers themselves. For instance, when asked whether they collaborate or compete with neighboring firms, most respondents reported that they did not, as a rule, collaborate. That brief denial was typically qualified at length by a description of a circle of reciprocal relations. Almost without exception, firms in both cases characterized their relationships with others in the district as “friendly” rather than “fierce.” Moreover, most informants scoffed at assurances of interview confidentiality. The message was, there are no secrets here. Although certain skills, techniques, and practices are guarded closely, it is commonly understood that information about products, markets, and management problems passes quite readily among the firms.

*How do negative economies affect cluster development?* Schmitz (1990) has suggested that external shocks may play a role in district development by helping firms within them adapt to disruptive circumstances. I discussed these things in detail within the case studies themselves, and will not restate those findings here. Broadly, however, instability and restructuring was observed in both input and output markets of both cases, and negative external conditions did engender growth and change within the districts. As the districts emerged, harsh external conditions tended to deter the dominance of any single firm, while favoring the districts as a whole and propelled their development.

In both districts, diffuse demand and local methods of work organization tended to discourage internalization and favor small firm formation. In both of these cases, external conditions discouraged firm dominance and consolidation in ways that are broadly consistent with Scott and Storper's (1987) description. Among the conditions favoring externalization noted in these cases were small, custom orders, diffuse purchaser markets, restructuring in the downstream markets, seasonal work, difficult input supply conditions, and specialized tasks with different optimal scales of production.

Pressures to externalize production are contrary to the persistent impulse of firms to accumulate and internalize the benefits of production. Some observed conditions appear consistent with the impulse to internalize. The log home district of the Bitterroot Valley provides the clearest examples, in reports of vertical integration by log home manufacturers backward into forestry management, and forward into design and marketing and into larger scale projects. That case identified firms that had slowly grown quite large by regional norms in the industry. Both cases provided examples of firms that had overextended themselves and crashed, i.e., were unable to balance uneven demand with the need for specialized materials and labor. This problem was best illustrated in the marine trades district of Port Townsend, where a succession of larger ship manufacturers were unable to maintain a stable of specialized workers. The fission of specialists into new firms remains a common dynamic of firm formation in that district.

The development of external markets can expand the realm of activity and favor accumulation within the firm, but exposes it to new risks. By limiting size and retaining general skills, firms in these cases reported an ability to expand and contract in scope.

Expanding firms shift work in and out depending on market conditions, and in harsh times, revert to reliance on the district itself as a source of work. The district, then, accelerates and intensifies the process of niche-seeking in at least three ways: by facilitating information about opportunities; by raising both the imperative and the ease of firm differentiation; and by providing fall-back options that reduce the risk of ventures into new markets and modes of operation.

***Motive forces of district development***

Districts are of particular interest in this study as they may inform the discussion of regional industrial change and development in relatively rural and peripheral places such as the American Northwest. Three main theories have aimed to account for the significance and prospects of contemporary districts. One speaks to a techno-economic shift, in which technologies affect innovation and growth in so broad a range of sectors as to constitute a system-wide economic shift and the emergence of new centers. A second engages product cycle thinking, and highlights the role of cheap and flexible labor in subsidizing the competitive advantage of new regional agglomerations. A third has its basis in the disintegration and globalization of markets set off by regulatory crises in mass production. Individually and together, these expectations reflect forces that have textured growth and change at a global scale. Some regions have seen direct and immense impacts from certain of these forces, as in certain high technology districts, or in rural and peripheral areas that have developed as centers for routine production. Such observations are consistent with technological change and product cycle thinking,

respectively. Some global markets have fragmented, as the flexible specialization school has suggested, generating new opportunities for regional accumulation.

If there is a problem with these three theories, it is in their tendency to attend to relatively weightless products and established hierarchical webs too much, and give notice to the geographic significance of bulk and value too little. Weberian location costs still constrain most industrial activities.

Based on these cases and this region, I would suggest that the main force that made possible the development of the studied districts was market growth embodied in regional population shifts. Let us suppose that Calvin Beale (1997) is right. The proportion of rural residents that stand (for whatever reason) to be displaced to urban locations is now small compared to the large number of urban residents who tend to move in an opposite, more rural, direction. Moreover, let us follow Beale's suggestion that, setting aside year-to-year variations in the balance of migration flows, the overall pattern of rural population growth will continue for some time. Changes on this order could incorporate the above accounts as elements in a mosaic of motivations that underlie human migration. This view implies long-term market growth in the rural and peripheral Northwest, which I believe could help us think more clearly about regional economic development as observed in these cases.

The motive forces underlying these cases appear to be as Alfred Marshall described them in his classic account of the rise of *urban* agglomerations, but stood on their head to fit contemporary rural growth. In 1890, Marshall concluded that urban agglomeration was wrought of agricultural intensification, the dominant socio-industrial

force of that day. Growth was, moreover, concentrated in "supplying those wants in regard to which the improvements of machinery help us but little" (1925, p. 277). In both periods, the key examples of agglomeration embody two simultaneous shifts in regional markets: a *locational shift* and an *industrial shift*, entailing the evolution of work toward less-mechanized, more labor intensive tasks (e.g., services, crafts, and technology).

The division of labor is limited by the extent of the market, Weber said. When regional demand increased in the log home case, market changes favored an altogether new interfirm division of labor in the construction industry of the alpine Northwest. Producers in the Bitterroot Valley capitalized on these changes. Two things are striking about this case. First, in a large sense, conditions favored externalization and fostered the division of firms, but not necessarily the division of labor between them. As capable producers spun off (capable) competitors, the cluster of firms was *not linked via essential contracting* relationships. Second, in these conditions, the proprietors seem to have acted intelligently and together *in anticipation of* benefits from agglomeration. In the process, they succeeded in localizing a substantial share of the regional activity in their industry.

In the marine trades case, the enabling market changes appear to have involved the changing locational preferences of producers themselves. The attraction of shipwrights to Port Townsend was associated with back-to-the-land motivations that were common in the 1970s. People wanted to live in this rather romantic town, and moving there offered good prospects for success in the marine trades. Not only was Port Townsend quite central to the boat-oriented consumers, the area also constituted a step up in quality of life over of the Seattle metropolitan area, with its high costs and personal



nuisance factors, and greater labor costs and risks of unionization. Friction from urban and industrial gravity, in this case, created centrifugal effects in this industry that favored spinning off.

Here again, people in Port Townsend noticed the changes in key market conditions and took advantage of them. The market was changing. External conditions favored the growth of multiple firms over “full service” providers, and conditions of externalization conformed with several of the players’ preferences of for autonomy and small firm organization. By organizing as an industrial community, proprietors could take advantage of changing conditions and chip off a fragment of the market for ship building and repair. Here again, and more obviously, community agency became the determining factor, as local proprietors developed a set of institutions and exchange practices suited to the new marine trades district.

I conclude that district formation in both of these cases was facilitated by regional shifts in population and concurrent growth in demand for specialized goods. In both cases, the growth of new market centers may be associated with the maturation of urban markets and consequent rural shifts. These maturation effects were more diverse than the rural ones that Marshall observed, but were of a similar nature. In both cases, however, human agency was critical to capitalizing on underlying market shifts in the creation of districts. This is most consistent with the flexible specialization accounts of market fragmentation and the French view about innovative milieu.

***Some issues and opportunities for further research***

This discussion has pointed to several features of the present cases that are inadequately explained by received theory. These observations could be viewed as issues for development in further research. The findings suggest that the recent literature on districts:

- (1) *Overestimates the role contracting as a catalyst and generative force of districts.*

Contracting relations appeared as symptoms and forces of agglomeration, but not primary drivers of district formation in either of these cases. Exogenous benefits were, by contrast, common and ubiquitous in the cases. This research suggests that the effects of contracting arise out of more general strengths of the district community, and not the other way around.

- (2) *Under-represents the role of entrepreneurial intent in district formation.* The development of these districts was consistent with the entrepreneurial intent of key local actors, whose actions helped propagate firms, referral practices, and norms of reciprocal exchange. Community entrepreneurship may extend to formal institutional action to promote agglomeration benefits.

- (3) *Underestimates the roles of market and community institutions in district functioning.* Neither local nor more expansive hierarchies appeared to be determining in the formation or functioning of these districts.

- (4) *Over-simplifies the variety of formal institutions.* Most of the literature fails to differentiate institutions that are enterprises of the districts themselves from broader policy measures that are outside the control of local actors. Entrepreneurial

anticipation of agglomeration effects may coalesce in local initiatives that help generate market gravity and lower barriers to entry of individuals and firms.

- (5) *Underestimates the role of non-innovators* in collaborative effects. District functions cannot be understood by reference to leaders and innovators alone, but must consider broader relations and diverse motivations that make reciprocal benefits possible. The potential contributions of “laggards,” for instance, appear to have been neglected in recent accounts of district functioning. It seems plausible that capable proprietors who are not oriented to growth might boost the productive capacity of the community by facilitating fluid exchange.
- (6) *Over-emphasizes the importance of global markets* in regional accumulation and underestimates the role of regional market growth. In both of these cases, regional markets played a leading role in accumulation. Gross population shifts favoring rural and peripheral growth, not the maturation of specific industries, favored the formation of these districts.

The dissertation has also noted some methodological points of entry for further exploration into the role and function of districts in contemporary rural and regional development.

Detailed national statistics could present an efficient means of identifying industries that are developing local concentrations of small firms, following the general approaches of Pollard and Storper (1996), Luria (1990), and Markusen (1998). There are several methodological challenges to a macro-analytical approach to district studies. One is that industries have little respect for our classification systems. Districts embody a

variety of industrial specialties, spanning multiple classification codes. *A priori* knowledge about the nature of local complexes being sought is helpful, and may be essential. Another is that data for many rural industrial specialties are often suppressed at more meaningful levels of spatial analysis, with the result that rural industrial clusters are often statistically invisible. (Oddly, the data on log home production in Montana was suppressed at the state level but available at the county level.) A third is that the census data appeared in both of these cases to substantially underestimate the number of firms and workers in these districts. Many firms appear to “fly below the radar” of the official census counts.

The limitations of rural industrial data make comparative and macro-studies difficult to develop with precision and help account for the reliance on case analysis of districts. I believe, in spite of these problems, that detailed data from industrial censuses have much to add to the geography of industrial change and agglomeration. In both of the present cases, substantial information was gotten from national data sources and some measures were discussed that could be replicated in a broader effort. For instance, in addition to identifying establishment numbers and size from the national statistics, I discussed measures of customization (the share of non-production to all workers, the share of growth in nonproduction wages) and transactions (merchandizing sales) as attributes that might be pursued in further research.

Another promising approach would be to undertake case analysis of several districts. Considering a larger number of cases could provide more quantitatively rich information and advance thinking about the general processes and effects of district

formation and function. (The original design for this research project called for case analysis of six wood products clusters in the American Northwest.)

Commonly (as Schmitz, 1995, noted), comparative cluster analyses have been carried forward with an industrial theme. This approach is useful for understanding the development trajectories within particular industries, and at the same it time helps control for a whole raft of peculiarities between broader industries, but many other themes could and should be explored in this fashion. For instance, casework on larger populations of districts could help tease apart industrial effects from the general influence of urban scale. I have criticized much recent work for simply defining industry-specific effects into the equation and defining out general urban effects – a swapping of new assumptions for old. Comparisons of cases along the urban-rural continuum could attempt to control for urban influence and disentangle these related scale effects. Along this line, research to develop quantitative distinctions between agglomeration and urbanization economies would be helpful. The work of Malecki and Tootle (1994, 1995) as well as Harrison et al. (1996) provide promising approaches.

One research approach would be to explore cases along a continuum of local versus export downstream markets. The resurgence of interest in industrial districts of the last two decades has tended to be highly selective of exporting industries, but it was not always so. Marshall's (1925) insights about districts sprang from observations of confectioners, innkeepers, messengers, etc. In contemporary conditions, studies of localized webs of construction firms and consulting service providers could provide rich opportunities for examining agglomeration effects in ways that disentangle the urban and

industrial mechanisms of agglomeration. The present cases were overwhelmingly white and masculine, which is probably a reflection of the demographics of the broader industries of wood products, construction, and boat building in the Northwest. Methods more attuned to the spectrum of industrial types might better attend to variety in the gender and ethnic attributes and consider districts from more diverse perspectives.

The youth of the present cases enabled an examination of their nascence, but at a cost to insights about how districts mature, and this too could be better explored with a richer population. Maturation effects, including labor organization, competition from diffuse producers, cutthroat competition, greater professionalism, and development of more formal institutional responses were noted in the literature. The present cases were roughly consistent with the idea that districts develop professionalism, competitiveness, and institutional sophistication with time. A richer population of district cases could explore and refine thinking about the variety of centrifugal and centripetal effects.

### *Lessons and implications for policy*

Central to early formulations of the flexible specialization thesis was the idea that a renaissance of industrial craft agglomerations could be brought about by reformulating public policies with that goal. The thrust of this idea, that districts could be built as a matter of public policy, has since been shown to be highly generalized and overly sanguine. The role of formal institutions in district formation and functioning remains, however, a difficult and interesting aspect of district studies.

Harrison (1994) called on policy-oriented researchers to say in more useful terms what works, under what conditions. Throughout this dissertation, I have carried forward

the idea that district benefits cannot be brought about in all places and situations. Basic conditions must be met, including local advantages, external economies, and leadership in the form of proprietors that are not only capable within their industries but who grasp when strategic advantages from clustering are both possible and desirable. In such conditions, there are a number of things that local, community initiatives could do to promote the development of district benefits.

Tickell and Peck's (1992) research, among others, has noted that districts arise in diverse regulatory settings, ranging at the extremes from highly governed environments to a cutthroat, free market atmosphere. This diversity was nicely captured in the present cases. Formal institutions had a negligible role in the log home case, and a very significant one in the marine trades case. The log home manufacturers of the Bitterroot Valley appeared to be quite averse to formal institutional efforts, and I conclude that formal institutional activity has had only a peripheral role in its recent functioning and no role at all in its formation. Clearly, formal institutions are not necessary for district development, but a key question remains. Is it possible for institutional action to induce district development?

In the marine trades district of Port Townsend, significant consequences followed the efforts of community entrepreneurs, as Johannisson (1990) described them, to build the local industry. Guided almost exclusively from within, local leaders developed formal institutions, which provided cheap space and infrastructure and lowered the costs of entry to new firms; effectively promoted the district and its products; trained workers

in specialized trades; and redeveloped the infrastructure to position the district in light of gross changes in the industry.

In this case, the data suggests that formal collective action was fundamental to that district's development. This goes well beyond the findings of Schmitz (1994) and others who have suggested that public institutions may improve the function of an established cluster, but are unlikely to create new agglomerations. Formal local initiatives appear to have been entwined in this district since the period of cluster formation. Still, the matter is problematic from the perspective of public program development, since nearly all of the formal institutions in question appear to have been instigated by the proprietors themselves. It seems fair to say that support from greater government bodies has been limited to periodic and inconstant dollops money. The main exception is the Port of Port Townsend, which receives local taxing authority and is governed by an elected body. This entity was in existence well before the period of clustering and, by most accounts, was not a part of local efforts to foment the marine trades cluster. The infrastructure advantages provided by the Port lowered costs of entry for new firms and promoted the concentration of activity in certain areas, which have been noted as significant factors in the district's emergence and development.

I believe the following can be said unambiguously about the role of formal institutions in the case of the marine trades district of Port Townsend. First, formal institutions preceded the period of firm proliferation and were intended to encourage that proliferation. Second, the institutions were very local and, excepting the Port, were initiatives of the proprietors themselves. Third, the institutions were nurtured in about the



same way private firms were. The Northwest community-based School for Wooden Boatbuilding, for instance, was recruited to the area by community members and maintains a sort of reciprocity with area firms: the school draws teachers from the district and trains workers. Fourth, these public institutions continue to play a dynamic and active role in shaping significant aspects of the district. For instance, the Port district recently undertook the development of the heavy boat haulout, which my informants widely expected to play a substantial role in growth and change in the district.

My findings tend to discount the idea that community initiatives should promote formal contracting linkages among firms, which is contrary to a substantial body of policy-oriented research (Sommers, Fossum et al. 1989; Cortright 1990; Schmitz and Musyck 1994; Humphrey and Schmitz 1996; Rosenfeld 1997). These analyses have suggested variations on the theme that “brokers” should help groups of firms produce products and develop markets together that they could not undertake separately. The literature reviewed suggests that such brokering efforts have yielded many more disappointments than successes, and these cases suggest that early contracting is not essential to developing district benefits. My conclusions do, however, accord with recent research that concludes that economic development initiatives need not promote collaboration to effectively promote the development of agglomeration benefits (Sommers 1998).

In the Port Townsend case, rich contracting relationships developed in time, as a function of market gravity and more casual (less contractual) types of exchange. What does appear to be necessary is an awareness in the community that agglomeration

benefits are both possible and desirable, that is, that a local proliferation and concentration of firms is consistent with the market conditions as well as the motivations and situations of individual firms. Initial community-based efforts may be best directed to helping firms identify growing niche markets, promoting the awareness (to producers) of potential agglomeration benefits and (to consumers) the area as a market center, and cultivating peer circles through which information and referrals may pass among firms.

I noted in chapter 2, that district effects may be neither coincidental nor induced, but the product of problem solving (technological learning) and know-how (production expertise) as those intersect in the local industrial setting in conditions of externalization. That interpretation views innovative milieu in the realm of informal institutions, and contends that what matters is the fluid process of problem solving among capable, but atomistic players. Real estate promotion and evangelizing for collaborative practices are of little fundamental consequence. What is modified by these conclusions is the idea that the players are atomistic. In both cases, the main actors were socially entwined and, in a large sense, purposeful about the development of these districts.

This research concludes that local public institutions can indeed play a significant role in the formation and development of districts. This still leaves a substantial question unanswered: can federal, state, or local governments devise policies and programs that could be effective in fomenting district development? On this score, I can note only that broader state and federal policies have had marginal, peripheral roles in the development of these cases. It appears, even in the case of Port Townsend, that most public initiatives

at the state and federal levels were so out-of-synch with the local situation as to have had, at best, only a marginal effect on its development.

One foundation-funded institution in the area, WoodNet, had been established to promote development of “value-added wood products networks” on the Olympic Peninsula. This institution is notable mainly because the program was inspired specifically by thinking about industrial districts by applied policy researchers (Friedman 1989; Sommers, Fossum et al. 1989; Cortright 1990). WoodNet, which ended shortly before these research interviews began, was mentioned only once in the entire course of these interviews, as “a singularly unhelpful institution.” The lack of productive engagement by WoodNet in the marine trades district might be attributed to the small institution’s focus on primary and secondary wood products and, and its charge to serve an imposing (three-county) territory.

Lack of engagement with this established district does not, however, permit us to score WoodNet as a failure; three separate assessments noted this institution’s significant success on the Olympic Peninsula (Rosenfeld 1993; Malecki and Tootle 1994; Sommers 1998). What does appear to be true about WoodNet’s experience is that it (like many similar efforts nationally) closed up after failing to garner any significant support from either state or federal governments. What is strangest about the failure of WoodNet is that it came at a time when a “timber crisis” had inspired state and federal governments to focus millions of dollars on the region in a variety of programs and aid packages.

It is my impression that state and federal policies are, overwhelmingly, designed to support industrial systems of a different sort, precisely as Piore and Sabel (1984)

suggested. This research cannot speak directly to the potential for broader governmental initiatives to foment district development, but I believe Piore and Sabel's policy challenge still stands.

Many industrial activities do, after all, receive much more than periodic and inconstant dollops of public money. Public funds today provide substantial cash incentives to support the efforts of rural and peripheral communities to establish themselves as screwdriver plants and telephone centers for remote hierarchies (paradoxically, this outcome that Amin and Robbins (1990) appear to dread most about policy implications of flexible specialization). Public programs for farm and forest development devote mountainous resources to these most basic of rural industries, which reap relentlessly diminishing returns for all but a few rural communities. Public programs for small business assistance and financing are consistently funded to aid scattered small holders. The bulk of state and local economic development programs in rural America today are focused on developing national exporters and diffuse small businesses. They are largely indifferent to regional markets and regional industrial centers.

There are a number of practical impediments to developing public state and federal policies and programs to promote district development in smaller and more peripheral areas. The idea that economic development efforts should focus on endogenous benefits for area-industries (which are free and at-large in communities) is up against significant vested interests, not least of which are within the state and federal agencies themselves. Programs focused on area-industries appear to be difficult to

engineer as centralized programs, and seem to depend on the quality of local leaders and investors. Opportunities for agglomeration and district formation are not available always and everywhere, but only in a certain areas, at certain times, and this raises the problem of differentiating services by industry and community and of equitably targeting scarce public resources. The impediments are, in sum, remarkably ordinary problems of rural development.

What our bias toward exporters and small isolates fails to consider is that interregional population shifts are long term and driven by complex forces. The same forces that are driving population shifts are supporting industrial shifts as well. In growing regions, especially, human movements are driving the progressive specialization of industries and the development of new spatial economic forms and structures. New districts may be viewed as one spatial manifestation of those overall shifts, and among the more desirable ones at that. If domestic economic development policies were more oriented to developing local competitive advantages, they might better support the reemergence of robust industrial centers and contribute to heightened regional capacities for dynamic industrial response. Those, I believe, are desirable goals.

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## Appendix 1: Interview Protocol

Date: \_\_\_\_\_

Respondent: \_\_\_\_\_

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

Headquarters location (if different) \_\_\_\_\_

Position of person being interviewed: \_\_\_\_\_

☐ President

☐ Owner

☐ Vice President - Sales/Marketing

☐ Other (specify) \_\_\_\_\_

How long has your firm been in business? \_\_\_\_\_

A. At this location? \_\_\_\_\_

i. What previous location? \_\_\_\_\_

B. Do you have operations at other locations? \_\_\_\_\_

i. Where? \_\_\_\_\_

ii. Producing similar goods, or different? \_\_\_\_\_

a. If different, what? \_\_\_\_\_

Why is the firm in this location?

Rate the importance of these factors as advantages of this location: (1 = not important at all, 5 = very important)

C. \_\_\_ Proximity to raw materials.

D. \_\_\_ Close to markets.

E. \_\_\_ Access to skilled labor.

F. \_\_\_ Access to cheap labor.

G. \_\_\_ Cost of land.

H. \_\_\_ Tax structure or incentives. \_\_\_

I. \_\_\_ Lifestyle.

J. \_\_\_ Access to supporting services.

K. \_\_\_ Access to or cost of transportation

What is the local origin of this firm? Describe and categorize:

- \_\_\_ Purchased from previous owner.
- \_\_\_ Moved firm from another location.
- \_\_\_ Expansion or branch of a different location.
- \_\_\_ Owner(s) moved to this area to start this firm.
- \_\_\_ Owner(s) split off from an existing firm to start this one.
- \_\_\_ Owner developed niche in this industry while working in related business.
- \_\_\_ Other (explain) \_\_\_\_\_

Proprietor history: What did the proprietor do before this?

2. What type of ownership structure does this firm have?

☐ Single owner/Family

☐ Partnership

☐ Corporation

3. What type of products does this firm manufacture? (Describe the range of products you make.)

4. How has your product line changed in recent years? (Product diversification.)

A. Examples of products added? When?

B. Examples of products no longer produced? When?

What percent of your production is in finished goods vs. component products (i.e., sold to other producers)? How has this proportion changed over the firm's history?

What percent of your production is purchased or contracted? What types of products? Location and size of the suppliers? Probe for examples and details.

Type of purchased elements	(a) Done in-house? (1 = all; 5 = none)	(b) Location of <i>most</i> frequent contactor	Location of <i>second</i> most freq. contractor	Business name of most freq.

5. Is there a ready supply of raw materials available in this area? Is there a supply of specialized raw materials in this area? Does access to materials give firms like yours a competitive advantage over firms in other locations?

6. Where do you sell your products? What is the relative importance in percentage sales to the following markets: (Probe: specific shares in each regional market.)

A. international (where?)

- B. national, beyond the PNW (where?)
- C. regional, PNW
- D. immediate region
- E. local area

7. How has this changed in the last five years? Record answer in same format:
8. Is there a ready supply of specialized labor available in this area?
9. Are training programs available?
10. Are there any support services available that contribute to the competitiveness of the firms in this area (marketing, machinery suppliers, financial, component manufacturers, specialization of labor, others)?
11. What other factors contributed to the establishment of this cluster of firms? Is there a key factor that influenced the development of the firms in this area (resource, market, lead firm,...)
12. Does your company interact with other businesses in your region (e.g., raw materials, processing equipment, finance...) Does your company interact with companies in other regions? Why?
13. Does your firm belong to any industry groups or associations? Which ones? Why did you join this association? Are they useful? In what ways?
14. Define the nature of competition within the cluster/industry. (Is competition fierce or friendly?)
15. What type of cooperation exists between manufacturing firms in the area? Probe: information, exchange, joint contracting. Probe: Is cooperation informal or more cooperative and structured? Is your experience typical of other firms in this area?
16. What of firms do you cooperate with? Probe for names and examples.
17. Are there any public/private development initiatives or programs in this area that benefit your firm? Are there any that *could* benefit your firm if developed?

Are there any public/private initiatives or programs in this area that hurt your firm?

How many people employed at this establishment? How many in the firm, if different?

Full time \_\_\_\_\_  
 Part time \_\_\_\_\_  
 Seasonal \_\_\_\_\_

One year ago, about how many people employed at this establishment? In the firm, if different?

Full time \_\_\_\_\_  
 Part time \_\_\_\_\_  
 Seasonal \_\_\_\_\_

Five years ago, about many people employed at this establishment? How many in the firm, if different?

Full time \_\_\_\_\_  
 Part time \_\_\_\_\_  
 Seasonal \_\_\_\_\_

18. Do the above questions reasonably characterize changes in employment at this firm?

19. To what do you attribute recent changes in employment?

20. Estimate your firm's total sales revenues in the last year:

\_\_\_ 0 to \$500,000  
 \_\_\_ \$500,000 to \$1,000,000  
 \_\_\_ \$1,000,000 to \$2,500,000  
 \_\_\_ \$2,500,000 to \$5,000,000  
 \_\_\_ \$5,000,000 to \$10,000,000  
 \_\_\_ more than \$10,000,000

21. How did sales revenues changed from the previous **year**?

\_\_\_ Much lower revenue this year, compared to last  
 \_\_\_ Somewhat lower  
 \_\_\_ About the same  
 \_\_\_ Somewhat higher  
 \_\_\_ Much higher revenue this year, compared to last

22. How did sales revenues changed from the previous **five years**?

\_\_\_ Much lower revenue this year, compared to five years ago.  
 \_\_\_ Somewhat lower  
 \_\_\_ About the same  
 \_\_\_ Somewhat higher  
 \_\_\_ Much higher revenue this year, compared to five years ago.

To what do you attribute changes in size and revenues?

## Appendix 2: List of Informants in the Log Home Case

Ken Theurbach, president  
Alpine Log Homes  
Hamilton  
hand crafted log homes

Kent Olsen, Proprietor  
Specialty Wood Products  
Hamilton  
cabinets and doors

Jeff Downey  
Frontier Homes, Inc.  
Hamilton  
hand crafted log homes

Mark Behrman, proprietor  
Weatherall  
Hamilton  
chinking & finishing

Allan K. Steele, VP, International  
Division  
Rocky Mountain Log Homes  
Hamilton  
manufactured log homes

Phil Alman, partner  
Glu-Lam Log, Inc.  
Victor  
laminated "logs"

Monte Sutton, proprietor  
American Craftsman Homes  
Emmett, ID  
precut laminated homes

Jim Cain, log home project manager  
Montana-Idaho Log Homes  
Hamilton  
hand craft log homes

Jim Robertson, proprietor  
The Rustics  
Condon, MT  
hand craft log homes

Jon Sellers, proprietor  
Garland Log Homes  
Victor  
manufactured log homes

Mark Neville, family-partner  
Neville Log Homes  
Victor  
manufactured log homes

Steve Peckinpaugh, proprietor  
Custom Log Homes  
Stevensville  
hand craft log homes, timber frame

Keith Robinson, President  
Mountain Logs  
Hamilton  
hand craft log homes

Wes Custerson, proprietor  
Three-K Log Homes  
Condon, MT  
hand craft log homes

Orlan Sorenson, proprietor  
Lincoln Log Homes,  
Lincoln, MT  
hand craft log homes (to finish)

Linzee Brockmeyer, president  
Logcrafters Log & Timber Homes  
St. Ignatius, MT  
hand craft log homes

**Bob Fisher**  
**East Fork Log Homes and Furniture**  
**Conner, MT**  
**hand craft log homes**

**Harley Hamilton, partner**  
**Northwest Logs**  
**Hamilton**  
**log brokerage**

**Paul Sichula**  
**Valley Board and Beam**  
**Victor**  
**custom milled beams**

**Wayne Cahoon, president**  
**Montana Rockies Log Homes**  
**Seeley Lake**  
**hand craft log homes**



### Appendix 3: List of Informants in the Marine Trades Case <sup>57</sup>

Earl Wakefield  
Admiral Marine  
Port Angeles  
yacht manufacture

Tim Rowe  
Atlas Technologies  
machining

Ernie Baird  
Baird Boatworks

Port Townsend  
boat and ship building

Charlie Moore  
Edensaw Woods, Inc.  
wood supply

Dan Johnston  
Falcon Marine

Port Townsend  
aluminum boat building

Mike Gilmukoff  
Gilmukoff Marine  
ship building

Mark Burn  
Integrated Marine  
marine refrigeration manufacture

Erik Andersson  
Jefferson County EDC  
economic development institution

Larry Montgomery  
Montgomery Maritime Survey Inc.  
marine surveying

Bill Curry  
Northwest School for Wooden  
Boatbuilding  
training institution

Wayne Cahoon  
Port of Port Townsend  
port institution

Carol Hasse  
Port Townsend Sails  
sail maker

Mike Stone  
Port Townsend Shipwrights Co-op  
boat and ship building

John Lockwood  
Pygmy Kayak  
kayak kit manufacture

Pat Mahon  
Rainshadow  
boat repair

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<sup>57</sup> Principal location in Port Townsend unless otherwise noted.

Doug Skallerud  
Skallerud Marine  
marine metal fabrication and repair

Chuck Flynn  
Steelhead Marine  
metal fabrication, systems, shipbuilding

Jim Worthington  
Thermionics  
machine manufacture

Bruce Tipton  
Tipton Rigging

Port Townsend  
rigging

Alecia Alvarez  
Wooden Boat Foundation  
community promotion and service  
institution

Barry Stevens  
shaft & systems

Grant Strand  
hydraulics

Richard Wilmore  
wooden boat repair

Rick Oltman  
fisher

## **Vita: Harold L. Fossum**

August 8, 2001

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### **E D U C A T I O N**

**University of Washington, Geography, Ph.D. Candidate, 1996**

**University of Montana, Masters of Business Administration, MBA, 1986**

**University of Montana, Psychology, BA, 1982**

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### **S E L E C T E D   E M P L O Y M E N T**

**City of Helena, Montana, planner, project coordinator (2000 – present)**

**Northwest Policy Center, University of Washington, Seattle (1989 - 2001)**

**Program Director, Rural Community Revitalization Program (to 1997)**

**Consulting researcher / coordinator (1998 – 2001)**

**Senator Max Baucus, US Senate, Legislative Assistant (1986 - 1989)**

**Montana Department of Commerce (1985)**

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### **S E L E C T E D   G R A N T S**

**US West Foundation, 1995, \$25,000, to train and assist community development groups with economic development strategy.**

**National Science Foundation, 1995, \$9600, dissertation grant on specialty wood products clusters in the rural northwest.**

**United States Forest Service Northwest Regional Laboratory, 1995, \$25,000, on local specialization of rural wood products manufacturers.**

**Aspen Institute, Rural Economic Policy Program, 1994, \$55,000, on value added enterprise development.**

**USDA Forest Service Regional Laboratory, 1994, \$20,000, on wood products revitalization in dependent areas of the rural Northwest.**

**Ford Foundation, Rural Poverty Program, 1992, \$150,000, on “best practices” in state and local revitalization.**

**Ford Foundation, Rural Poverty Program, 1989, \$150,000, to write and disseminate *Communities in the Lead: The Northwest Rural Development Sourcebook*.**

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## PROFESSIONAL PRODUCTS

### **Selected publications and academic presentations**

*Searching for Work that Pays: The Northwest Job Gap Study*, with Northwest Policy Center and Northwest Federation of Community Organizations, January 1999 and June 2001.

*Who Moves and Why: Unpacking the Characteristics and Motivations of Metro-to-Nonmetro Migrants* with Priscilla Salant (Washington State University), submitted for publication to *Rural Sociology*, May, 1999.

*Agglomeration in Deconcentration: Wood Products Craft Clusters in the Rural Northwest*, Annual Meetings of the AAG, Boston, 1998.

*Failed Hopes or Dreams Come True: Key Factors in Recent Rural In-Migration*, Priscilla Salant, Harold Fossum, and Don A Dillman, Annual Meeting of the Rural Sociology Society, Aug 15, 1997.

*A Marriage of Brains and Bootstraps: Small Town Strategies for Building Development Capacity*, in Northwest Report, Northwest Area Foundation, November 1993.

*Communities in the Lead: The Northwest Community Development Sourcebook*, Northwest Policy Center, 1993.

*Forging Sectoral Linkages: Strategies for Increasing the Vitality of the Wood Products, Food Products, and Metal Manufacturing Industries in Washington*, with Paul Sommers, Timothy Leinbach, Bob Watrus, et al., Northwest Policy Center, 1989.

### **Editorials, Speaking and Training**

*Montana's "Job Gap."* Panelist, Economic Development and Job Creation in Montana, Hunger and Homelessness Conference, Helena, October 7, 1998.

"Are timber industry health and community health compatible goals?" Panelist, Annual meetings of the Montana Wood Products Association, July, 1998.

"Old Idea, New World: Adding Value to Wood", editorial Portland Oregonian, Tacoma News Tribune, and Eugene Herald, and other regional newspapers, December, 1997.

"Manufacturing Matters," US Forest Service National Conference on Community Assistance, Kalispell, Montana, August, 1997.

Keynote address -- "*Arizona Economic Development Leadership on Trial*," and Presentation -- "*Community Leadership In Economic Development*", Arizona Governor's Summit on Rural Development, September, 1995.

"Adding Value in Farm and Forest," a three day training program, Cooperative Extension Service, Five State Community Leaders' Training, April 1995.