

PERSPECTIVE

No “Greek-Letter Writing”: Local Models of Resource Economies

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ABSTRACT In trying to understand resource economies, the article develops the idea of local models. A local model, in contrast to a universal model, is sensitive to the peculiarities of geographical context. Those peculiarities, rather than being reduced to some higher order of logic as in universal models, are kept intact, forming the very basis of understanding. Our approach to local modeling draws specifically on institutional economics. That tradition makes the argument that the economy is shaped by various institutions (not all of which are economic), which are continually changing and which take on different constellations in different places. By setting out a grid of central institutions operating in resource economies, and comparatively using the examples of the forest economies of British Columbia, Canada, North Island, New Zealand, and Tasmania, Australia, the article constructs three local models. Each has the same constituent elements, but how they are related and what eventuates are peculiar to the specific region.

Introduction

Often, “model” in the social sciences means the formal, universal type. Couched in an abstract logic and vocabulary and predicated on a set of exact causal relations among constituent variables, this type of model is tested using numerical data and rigorous statistical methods. As a modeling practice, it best characterizes orthodox economics and those parts of social science that have come under its influence such as regional science and certain strands of economic geography. The well-known economist (and new economic geographer) Paul Krugman is a firm believer in this form of modeling. He writes, “To be taken seriously an idea has to be *something you can model*” (Krugman 1995: 5; original emphasis). Also, by modeling, he means primarily the mathematical kind, “Greek-letter

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writing” as he calls it (Krugman 1990: ix). While admitting that “people who do not write formal models may have rich insights,” he also says, “Strangely, though, I can’t think of any” (Krugman 1995: 88).

While not detracting from the usefulness of formal models, this article suggests that other useful styles of modeling exist, especially for the case of resource economies. In this sense, Krugman’s stance is too narrow. Specifically, this article argues for the merits of what one can call local models, which are typically neither expressed formally nor invoke universal assumptions. Formal representations in orthodox economics often call upon universal concepts such as rationality, or the laws of markets, or the general logic of equilibrium that then function as the backstop for knowledge, guaranteeing validity and ensuring the truth. They abstract from local messiness and contingency imposing a universal order on a presumed local disorder. Local models, in contrast, seek to keep at least some of that messiness, contingency, and disorder in place. To lose those qualities, they suggest, is to lose something important about the phenomenon understood. Local models, then, by their very constitution are sensitive to the context to which they are applied. The contention of this study is that local models also offer rich insights. Rich insights are not the sole prerogative of Greek-letter writing.

The article is divided into three parts. First, it elaborates on the meaning of local models and the tradition within economics with which they are best associated, institutional economics. Second, it argues that local models are especially suited for the study of resource economies, our substantive research focus, and it delineates a few of the elements that might make up such models. Finally, examples of local models are offered by drawing upon comparative research that were recently completed on forest economies in British Columbia (BC), Canada; North Island, New Zealand; and Tasmania, Australia. While there is not an α , β , or γ in any of our models, the article argues that they provide understanding and insight.

Local and Universal Models, and Institutional Economics

Key to this discussion is a distinction between two different kinds of models: universal and local. Adherents to universal models believe that the model hooks on, and stands for, matches with the world it represents. There is an intrinsic connection between the model and reality. That conformance is guaranteed by following a set of strict scientific procedures, and is characterized, according to Gudeman and Penn (1982), by the following features: (1) a formal vocabulary, often a mathematical one, (2) precise definitions and clear inference rules for making connections, (3) an assumption that those definitions and inference rules are universal and invariant, and (4) rigorous correspondence rules relating the model and reality. This is clearly Krugman’s view, the Greek-letter writing view, and it is exemplified by orthodox economics. By following these strict requirements, universal models inherently stand for pieces of reality. They represent the essential underlying relations of the world.

Universal models are universal because they suppose that the model’s correctness stems from a set of definitions and logical procedures that transcend the local conditions to which

they are applied. Those definitions and procedures stand outside the context investigated, providing a secure foundation for correspondence.

In contrast, adherents to local models are skeptical of any definitions and procedures that claim to go beyond the local. Models in this view are always constructed and deployed within particular local settings, which cannot be escaped. Local modeling is a much looser conception of modeling than the universal kind. Rather than necessarily relying on formal universal structures of logic, verification, and explanation, it admits a diverse vocabulary, acknowledges ambivalent definitions and nonlinear logics, allows conceptual ambiguity, and presumes only a limited correspondence between the terms of the model and the world. There is no single test to accept or reject conclusively, once and for all, the relation between the model and the world. The relation is much more hesitant and piecemeal, less certain and implacable.

The significance of these features is that they allow for the possibility of a greater sensitivity to local peculiarities. Not all parts of the world are reduced to the same universal set of terms, but because of the openness of the modeling practice, the local is allowed to stand on its own terms.

Local modeling is found in different forms across the social sciences, and it exists even within economics, albeit the heterodox kind. Its best-known form is institutional economics, which has sometimes influenced economic geography. Established by the American maverick economist Thorstein Veblen, institutional economics was founded as a made-in-the-U.S. model: an economics designed for, and within, the peculiarities of late nineteenth century American capitalism (Barnes 1999; Hayter 2004).

Veblen was suspicious of universals, always wanting to see them less as timeless truths than as the result of a specific (local) Western culture (see especially Veblen 1957 [1918]). His concern was not to construct a model to explain everything but to understand the "queer customs" of his own time and place (Mayhew 1988: 25–27). He did this by emphasizing the institutional character of life that he thought was context-specific and always changing. By emphasizing institutions, defined as "settled habits of thought," Veblen (1919: 239) believed he could keep his feet firmly on local ground. It is for this reason he criticized orthodox economics' rationality assumption, satirizing "economic man" [sic] as a "homogeneous globule of desire . . . [with] neither antecedent or consequent" (1919: 73). The rational choice assumption is predicated upon precisely the universalism that Veblen wanted to vanquish, denying the complexity and instability of local institutional effects. Instead, Veblen tried to construct a local model that moved ". . . beyond the bounds of the . . . ratiocinations of the individual into the meanings and institutions of culture" (Dugger 1992: xxvii). He did this by stressing institutions: "the wants and desires, the end and aim, the ways and means, the amplitude and drift of the individual's conduct are functions of an institutional variable that is of a highly complex and wholly unstable character" (Veblen 1919: 242–243). It is an idea he develops in perhaps his best-known concept, "conspicuous consumption," formulated in *The Theory of the Leisure Class* (Veblen 1973 [1899]). Consumption is not a universal rational act, Veblen argued, but is deeply connected to various institutions defining in his case the idiosyncrasy of a late nineteenth century Gilded

Age American capitalism. Party guests at Newport, Rhode Island mansions lit cigars bound in \$100 bills not because it was the most rational choice of wrapping paper.

Veblen offered a model of the American economy sensitive to its localness, bringing together a set of novel vocabularies and relationships. He did not claim it applied everywhere, or was eternal, but it at least held and made sense of the place and period in which he lived. With that said, his model has traveled (and continues to do so as contemporary discussions around institutional economics show), but its effectiveness must be worked through at each new time and place and not simply asserted because of a presumed universalism. Likewise, parts of Veblen's model can be expressed formally (certainly, Wesley Mitchell, a student of Veblen, was renowned for statistical formalism) but such warrant is found on a case-by-case basis and not a methodological precept to be dogmatically applied.

Another example of a local model, one more germane given this study's interest in resource economies, is the work of the Canadian economic historian Harold Innis. Influenced by Veblen (Barager 1996) but certainly no clone, Innis aspired to a model appropriate to the distinctive conditions of Canada. Innis thought that existing economic models of Canada, which were framed in terms of its economic comparative advantage in resource specialization and trade, relied on universalist assumptions not borne out in the country. While they might suit Western Europe where that trade model was created, they did not suit Canada. As Innis (1956: 3) wrote, "Canadians are obliged . . . to fit their analysis of new economic facts into an old background. The handicaps of this process are obvious, . . . resulting in a new form of exploitation with dangerous consequences." His response was a made-in-Canada solution: the staples model. It was a model constructed from those elements that he thought were most distinctive about Canada's economic formation based on staples exports—an enlarged role of the state, the presence of large foreign corporations, the concentration of wealthy domestic banks, a widespread geographical scattering of resource sites, and reliance for both extraction and distribution on particular kinds of heavy equipment and technology. Holding these elements together in Innis's local model was a novel metaphor, the cyclonic storm (Barnes, Hayter, and Hay 2001). Staples-producing areas were for Innis "storm centres to the modern international economy" (Innis, quoted in Stamps 1995: fn. 63: 59). When institutional conditions were right, resource extraction proceeded with cyclonic frenzy. But once the storm moved on, left in its wake were environmental despoliation, abandoned single-industry towns, and underutilized sunk capital.

Like Veblen, Innis invented his own vocabulary as he went on, prosecuting a distinctive logic of connection. As Patterson (1990: 32) comments, Innis constantly moved between ". . . one idea from one medium or frame of reference to another and . . . he did not do so by logical connection but by way of analogy. . . . He was engaged in 'pattern recognition.'" This is exactly the case with his use of the cyclonic metaphor. It captured the instability, intensity, unpredictability, speed, and sometimes the devastating effects of staples production (Berger 1976: 97). In applying this metaphor, Innis was less concerned with logical derivation than with drawing attention to the similarities between dramatic

natural and economic events. It was no Greek-letter writing, but as a model, it struck a deep local resonance.

Local Models, Institutions, and Resource Peripheries

The lexicon of local models, with these two examples having been drawn from institutional economics, has been useful in allowing us to frame and conceptualize the joint work we have carried out now for over twenty years on resource peripheries. Much of that work has focused on the forest economy of BC, but it has extended recently to include the forest economies of North Island and Tasmania.

First, the idea of local models provides a justification for deploying models that lie outside standard (orthodox) theories. Those standard theories, as Innis suggested for the theory of comparative advantage, are primarily designed in and for core industrial production regions and not for resource peripheries. This is also the case in the discipline of economic geography. Recent discussions in the discipline around, for example, industrial districts, innovation systems, "slippery spaces," and untraded interdependencies, were designed for core-economic regions, bearing only tangentially on resource economies (Hayter 2004; Hayter, Barnes, and Bradshaw 2003). Thus, staples are typically produced in single-industry towns (with no industrial districts). Innovations used in the resource sector are imported from metropolitan cores (not developed in the resource margin). The natural environment sets the location of resource industries (space is fixed not slippery). Trust within a resource industry means relying on the skills of, say, the log boom operator to avoid physical injury (and not for untraded interdependencies). While contemporary discussions in economic geography may not exactly produce "exploitation with dangerous consequences," they are often inapplicable to resource economies, and insofar as they are applied, they can mislead. Local models, in contrast, are an incentive to question the appropriateness of standard accounts and to put alternatives in place.

Second, local models point to the elements required to construct those alternatives—in this case, the elements that make resource regions distinctive, forming the bases of their exceptionality. Following institutional economics, different institutions and their changing constellations are keys. Local models of resource regions, in this reading, are about figuring out important institutions, their operation, and their relation to other institutions. In particular, within resource economies there are specific institutions that need to be discussed (which are elaborated below), institutions that play almost no role in core manufacturing and service regions (for example, indigenous peoples and their claims on resources). Focusing on such institutions provides the beginning for understanding the particularity of resource regions. Furthermore, such institutions do not necessarily match up with neatly defined social spheres—economy, culture, and society—but are mixed up and muddled. Of course, this was Veblen's point with notions such as "conspicuous consumption"—economic commodities and cultural status bleed into one another, rendering problematic the very idea of a separate economy and culture. Similarly, institutions, for example around indigeneity, crosscut and fuse different social spheres. Local models direct observers to these complex, geographical, and institutional assemblages.

Finally, local models allow for recognition of messiness, that events and actions do not necessarily hang together or resolve themselves harmoniously. There is little sense of this in orthodox models. Assumptions about rationality and equilibrium, and which Krugman thinks are central to his kind of modeling (“maximization [of something] and equilibrium [in some sense] are the two fundamental principles of economic modelling” [Krugman 1995: 75]), analytically ensure that there is always some kind of a “happy ending” (Krugman 1995: 88). The experiences of resource economies, however, are such that there are few happy endings. Disagreement, contestation, and even armed conflict are more common. For example, the battles, miseries, and lost lives around oil during the last century, which continue into this one, are monumental and chilling. On a less epic scale are the everyday vicissitudes of resource economies that include unstable markets, the resource cycle, periodic unemployment, community expansion and hollowing out, and capricious trade regulations (Barnes, Hayter, and Hay 2001). Innis, with his local model, sought to represent and understand the fraught and fractious nature of resource production and its local geography. This was the point of the cyclonic metaphor. It represented the whirlwind ferocity of capitalist accumulation at resource sites, and the instability that followed including in some cases, their equally ferocious decline and fall.

While this case for local models is not restricted to resource peripheries, it is perhaps the best case to which the idea should be applied. Resource peripheries are sites of complex, often conflict-ridden institutional relations that connect industry, politics (local, national, and international), culture, and the environment, and they are typically not found in core economies or their representations. By their very openness, local models capture the resource periphery’s fraught and convoluted nature. More specifically, four institutional forces are especially important for understanding resource peripheries: industrialism, regulationism, environmentalism, and aboriginalism (Hayter, Barnes, and Bradshaw 2003).

Industrialism means the organization of the resource economy by private capital, usually corporate capital. On the front line of the production of resources are typically large corporations like Shell or Weyerhaeuser that extract primary commodities, sometimes processing the resource but always exporting it. As institutions, they are doubly tied to particular geographical locations: first, to the sites of the resource itself, and second, to the large capital sunk costs necessary for extraction and processing (e.g., mines or pulp and paper plants). While in this sense the industry is characterized by geographical immobility, corporations buy and sell these spatially fixed assets among themselves—a process that can involve third parties not directly involved in either extraction or processing (pension funds, for example, may own a forest plantation but lease the cutting rights to others).

Regulationism means the regulatory effects of the state at all levels on the operation of resource production. The state can own the resource, set the rules on how extraction occurs, and perform the role of an umpire (interpreting the rules) in disputes among stakeholders.

However, the state is no monolith either in purpose or organization. The local state is usually the level that is most visible, but behind it is a federal one with which it may or may not be in alignment. Furthermore, one national state may seek to regulate another national state's resource extraction, and supranational (quasi-state) regulatory bodies like the World Trade Organization (WTO) regulate many states.

Environmentalism means the effect on resource production of environmental nongovernment organizations (ENGOS) such as Greenpeace. For at least the last forty years, ENGOS have functioned as watchdogs over environmental use, and have often been in conflict with corporate resource producers and the state. Concerned with direct action, lobbying the powerful, and disseminating information to shape public opinion, they are increasingly as global and mobile as the corporate capital they seek to constrain.

Aboriginalism means the increasing role of native peoples with respect to treaty rights, land ownership, and resource ownership and use. Until the 1970s, it was widely assumed that aboriginal ways of life would succumb to industrialization and disappear (Moore 1963). On the contrary, in recent decades the fight for aboriginal rights has become more forceful, frequently involving resistance to plans for industrial development involving blockades, court challenges, and political lobbying (Posey 1999). Moreover, aboriginal opposition to resource development has increasingly been taken to world forums, in part relying not only on ENGO networks but also on networks created solely by aboriginal peoples, and sometimes in conflict with ENGOS (Nietschmann 1997).

For the purposes of this article, the usefulness of this fourfold scheme is in highlighting the key institutions operating within the peculiar dynamic of resource production. Sources of change and conflict found within the resource sector are played out through these four institutions that then give meaning to the resource as a disputed object. Note that the scheme does not presume a single general logic of causation, neither does it invoke universals like rationality nor end-of-history points like equilibrium, and nor does it rely on a formal vocabulary. But it is sensitive to geographical specificity. It suggests that how institutions come together (or do not) in different regions make for different kinds of resource economies. To use the terms introduced earlier, at different places one will find a different local model, a different working out of the relations among the four institutions propelled by the same production of resources.

Local Models of Three Forest Economies

The rest of this article illustrates our argument and scheme by focusing on the forest economies of BC, North Island, and Tasmania. Each region has a rich, complex, and extensively documented industrial forest history (e.g., Barnes and Hayter 1997; Dargavel 1995; Hayter 2000; Le Heron and Roche 1985). They differ significantly in terms of the scale and nature of industrial structure, tree species utilized, evolutionary trajectories, geo-

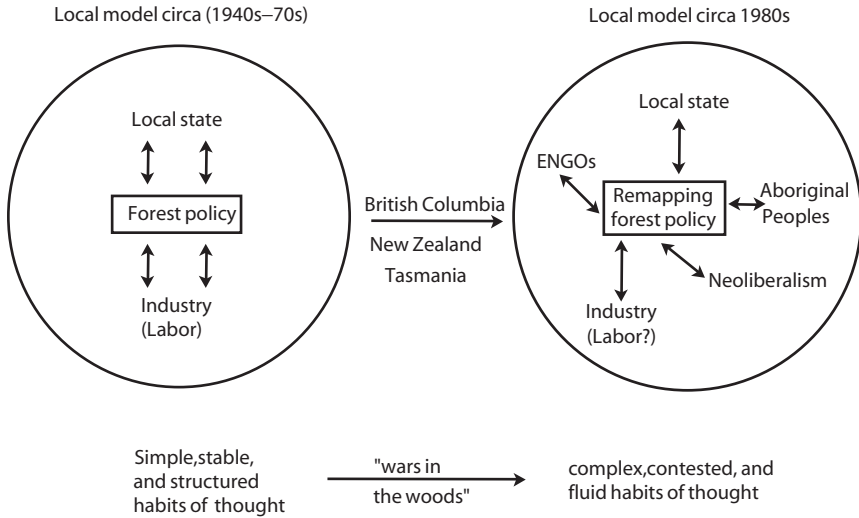


FIGURE 1. EVOLVING LOCAL MODELS OF THREE EXPORT-BASED FOREST ECONOMIES.

graphical circumstances, and policy frameworks and initiatives. Nevertheless, there are also important similarities among the regions that provide comparison. They were all developed within a framework of British imperialism in the nineteenth century, followed by white settler policies engendering particular attitudes and responses to native populations. They are characterized by similar democratic and legal traditions as well as attitudes to resource exploitation. After 1945, all three regions were supportive partners of a Pax Americana including a belief in free trade represented by the General Agreement on Tarrifs and Trade (and since 1995 by the WTO).

This article argues that understanding the often-contested histories and geographies of these three resource peripheries requires a particular approach, local modeling. It is an approach that recognizes the peculiarities of forestry as an industry, emphasizes the varied large-scale institutions and their intricate intersection that governs and ultimately produces the forest as a resource, and accepts endemic conflict and instability within forestry, and which is often without a happy ending.

Local models are not timeless, though, but change according to new circumstances. Certainly, this is the case for these three forest economies. Each region experienced considerable transformation from the 1970s (Figure 1). From 1945 to sometime in the mid- to late-1970s, forestry in each region was stable and structured, dominated by bargains among government, (big) business, and labor. Leading institutional stakeholders shared the same values about the importance of export-driven forest commodification. Since the 1980s, however, these values have become more fluid, complex, and contested as a wider

range of institutional interests have sought to remap forests in BC, North Island, and Tasmania, according to objectives no longer captured by a common interest in export and mass production. In all three regions, ENGOs have emerged as strident opponents of industrial forestry while aboriginal voices, so long neglected, now exercise important influences. Concurrently, there were also significant changes in regulationism at all levels, often toward some form of neoliberalism, and creating a changed trade environment as well as encouraging privatization and raw material exports.

The notion of a local model, this article argues, helps sort out and make sense of the different conjunctions of these complicated crosscutting changes involving the industrial, the political, the cultural, and the environmental, in the three different jurisdictions. Given the brevity of this article, however, we can only show such conjunctions schematically. The article first contextualizes the three regions historically, and then discusses the peculiar local model emerging within each (Figure 1).

Historical perspective. In an era of European voyages of exploration, James Cook's trans-Pacific adventures helped map and establish British hegemony and permanent European settlement in all three regions. In Tasmania, a penal colony was established in 1804, while fur traders and farmers heralded fledgling European commercial contacts in BC and North Island around the same time. Resource wealth, including forests, was the basis for large-scale immigration.

During the nineteenth century, forest exploitation was sporadic but gained momentum. Tasmania's penal colony and the growth of Hobart provided a stimulus to logging and sawmilling. In North Island, there was a massive deforestation giving way to large-scale white settler farming. In BC, gold rushes in the 1850s stimulated mining, settlement, and demands for timber. The coastal sawmilling industry of BC greatly expanded, not without busts, between 1870 and 1914 in response to the demands of transcontinental railroads, settlement of the Prairies and the needs of Vancouver itself. Forest activities also grew in importance in Tasmania in this period while on North Island, small-scale forest activities also occurred, and their product was used in emerging urban centers such as Auckland and Wellington.

The allocation of forests to users developed on an experimental ad hoc basis. BC joined the Canadian Federation in 1871, Tasmania became a state in 1905, and New Zealand was effectively created in 1840 with the Waitangi Treaty signed between the British Crown and Maori chiefs. Both BC and Tasmania had autonomous control over forests within their national federations. In North Island, resource rights in effect were owned and controlled by the Crown, although the Waitangi Treaty supposedly retained some of those rights for Maori. While some forests in all three jurisdictions were privatized in these early decades, the lion's share remained in public control. Further, governments in all three places sought to use forest leases of one kind or another to promote industrial exploitation.

At European contact, aboriginal populations were present in BC, Tasmania, and North Island. The situations and responses, however, were quite different. In North Island, a relatively large Maori population had already exercised considerable effects on forest cover, which they had reduced by 50 percent from 1000 AD to 1840. In contrast, Tasmania's Abo-

iginal Peoples, as elsewhere in Australia, exerted long-term effects on vegetative cover through fire, but there was no extensive clearance for farming. With European settlement, Tasmania's aboriginal population was largely eradicated by the 1860s and survivors relocated to Flinders Island (about 3 percent of Tasmania's current population is now classified as aboriginal, although there are disputes over the classification). Meanwhile in BC, few treaties were signed with natives in the nineteenth century when Europeans began full-blown settlement. The aboriginal population was already small and scattered, decimated by the spread of small pox from the south. While a reserve system was created, aboriginal influence over forest resources was effectively ignored.

With respect to forestry practice, in both Tasmania and BC there was a belief in the apparent limitless extent of forests and in their ability to renew themselves once harvested. New Zealand's experience was slightly different. From 1840 to 1920, incoming European settlers reduced New Zealand's forest stock by 50 percent again. Fearing complete forest liquidation and following a Royal Commission on Forestry, the Forest Act of 1921–1922 resulted in the inauguration of forest plantations, the first boom period occurring in the 1920s–1930s, (the second in the 1960s–1980s), and initially focused on the North Island. Radiata pine, a native of California introduced to New Zealand in the 1840s, with a rotation period of only thirty years, now comprises 90 percent of the species planted. Tasmania's experience with exotic forest plantations is more recent, largely since the Forest Practices Act of 1985, and has similarly favored Radiata pine although eucalyptus species are also noteworthy, comprising 37 percent of the planted total. Meanwhile, BC's accelerating commitment to forestation began in the mid-1970s and, in contrast to both New Zealand and Tasmania, has scarcely involved exotics but has sought to replicate the tree species harvested. In coastal BC, for example, Douglas fir, hemlock, and western red cedar dominate planting efforts.

More generally, the forest resources of BC, North Island, and Tasmania became largely conceived in terms of industrial potential. Each jurisdiction recognized that the full realization of the potential of forest resources as industrial commodities depended on the exploitation of export markets. Domestic markets had been vital to early developments of the forest industries but exports were needed for large-scale growth. This goal was comprehensively realized during the 1940s–1970s (“Fordist”) period, when all three jurisdictions pursued similar policies of leasing out vast tracts of timber in return for large-scale integrated forest product development that featured pulp and article as well as wood processing. In BC, the main export market was the U.S. and for the other two regions, Japan was the key. The scale and diversity of development was greater in BC, but in all three regions forest products experienced stable growth for thirty years under the control of government and business. Labor was unionized and endorsed the export-based mass production model in return for increasing wages and nonwage benefits.

In all three regions, however, this Fordist model came under increased scrutiny since the 1970s, partly because of technological change but mainly because of the rise of new institutional voices antagonistic to prevailing forest policies. The eventual result has been a set of new and regionally specific local models of forestry.

British Columbia. In BC, forestry began to change during the 1970s with the emergence of ENGOs and with the increasing dissatisfaction by First Nations peoples who began to lodge land and resource claims in the absence of signed treaties.

The old model was one in which the local state and private corporations together tightly defined forestry. The local state through the Ministry of Forests owned and managed the forest stock, leasing cutting rights according to the principle of "sustained yield," which was formally set down in the Forest Act of 1947. Large corporations, many of them foreign (although the largest was the BC-owned, MacMillan Bloedel), and mass-produced standardized forest products such as construction grade lumber, plywood, and kraft pulp primarily for export markets. Aboriginal claims to territory were for the most part ignored, as were environmental consequences (clear-cutting and "natural" regeneration of native species were the norms).

By the early 1980s, however, a new model began to surface. Industrialism became increasingly defined by flux and vulnerability. From 1980 onward at different times, old corporations left the province; new firms entered; other firms went bankrupt, or were taken over, or merged; and old firms even returned. Further contributing to corporate instability was large-scale industrial restructuring. In response to changing markets, there was a move toward manufacturing niche goods such as specialized wood products. As a result, several BC mills were either closed down or massively overhauled in line with the introduction of flexible production methods, creating unemployment, reduced incomes, and community distress.

Second, regulationism also changed as the old alliance between the state and corporations weakened. At the most local level, at the scale of the community, there was greater emphasis on entrepreneurialism as the state withdrew, and corporations restructured operations. Consequently, single-industry towns experienced a reduction of industry, looking toward alternative forms of business. At the provincial scale, the BC government strained its relationship with business by increasing resource royalties ("stumpage rates") that it charged on harvesting rights. It did so partly because of intense pressure from U.S. lumber producers who accused it of subsidizing those rates in the past, and partly to pay for more stringent environmental regulations. Indeed, at the international scale, a long-established continental free trade regime was replaced by U.S. protectionism, specifically various restrictions on the import of lumber from BC. In response, during the 1990s the provincial government passed a battery of new laws, led by the Forest Practices Code, a new stumpage regime and an expansion of BC's parks area to over 12 percent of provincial land, as they sought to regulate the industry on a more environmentally sustainable base.

Third, these more stringent environmental regulations were precipitated in part because of highly effective political lobbying and protest from newly created ENGOs. Through the 1980s, there were valley-by-valley demonstrations in BC by environmental groups to prevent old growth logging, culminating in the protests to end all protests at Clayoquot Sound in the summer of 1994 on the West Coast of Vancouver Island, when a thousand people were arrested for mass civil disobedience. Such protests along with the lobbying and boycotting of customers of BC wood products like Home Depot and the *New York*

Times subsequently produced significant changes in the forest industry. Selective logging rather than clear-cutting was adopted, and certification of the origins of the wood product (the most well-known is the Forest Steward Council standard) is increasingly necessary for firms to sell any product at all.

Finally, First Nations peoples have played an increasing role in forest policy. While often joining with environmental groups to blockade particular logging sites (for example, the Nuu-Chah-Nulth band were active at Clayoquot Sound), they also pursued their own strategies often involving the courts in land and resource claims. The 1997 Delgamuukw decision by Canada's Supreme Court on land claims by the Gitksan and Wet'suwet'en Nations, reversing an earlier BC Supreme Court decision, was especially important. Most recently, the Haida band in Haida Gwaii' (Queen Charlotte Island) are using the courts as well as physical blockades to assert their right to control the use of Tree Farm Licence 39 that covers most of the island. Held initially by MacMillan Bloedel, the Haida successfully challenged the transfer of its title to Weyerhaeuser in 1999 because of the absence of consultation with the band. Weyerhaeuser's attempt to sell the leasing rights to Brascan is now similarly contested.

In BC, the local model of staples production that materialized over the last twenty-five years is rife with conflict (and reflected in the moniker used by its participating groups, "war in the woods," [Hayter 2003]). Yet, there seems little prospect of resolution: institutional antagonism remains the name of the game, deeply coloring the meaning of the local forest economy model.

North Island, New Zealand. The same institutional players are prominent in the forest industry in New Zealand, but how they interacted, and the resolutions they forged, were very different, creating a very different local model.

The late 1970s and early 1980s in New Zealand, like in BC, were a period of transition when institutional relations were remade. Precipitating the change was an economic crisis (high unemployment, high public debt, and the flight of foreign capital). It resulted in 1984 in the replacement of New Zealand's National Party by David Lange's Labor Party representing, somewhat oxymoronically, both a lurch toward neoliberalism, and a lurch toward green and native politics. The eventual result was both a massive withdrawal of the state from forestry, and perhaps unexpectedly relative peace between industry and environmental and native groups.

Over this period, corporate capital was in a state of flux. While Carter-Holt-Harvey continued to own wood plantations (just over 17 percent of New Zealand's total in 2003–2004), and to carry out integrated forest operations, the other big New Zealand company, Fletcher Challenge, was broken up in 1999 into various divisions that later became Tenon Ltd., with its pulp and paper operations sold to Norske Skogindustrier in 2000, and its land holdings liquidated in 2003. In fact, many of the principal owners of plantations are now offshore investment companies like Hancock and the Harvard Endowment Fund.

Such a change was a consequence in part of the privatization of cutting rights on state land holdings, as the New Zealand state withdrew from forestry in line with its new neoliber-

eral ethic. More specifically, in 1987 it dissolved the state-owned New Zealand Forest Service, splitting it into two functions: (1) the corporate (later privatized) entity New Zealand Forest Corporation, and (2) the noncommercial Ministry of Forests concerned with environmental regulation and management. In line with the state's exit from forestry, from the early 1990s it began massively selling off cutting rights to the plantations it owned, as well as deregulating the industry including log markets. In this sense, the state's relationship to private forestry capital did not just weaken over the last twenty-five years as it did in BC but also became increasingly nonexistent.

However, the state remained attuned to the interests of ENGOs. Concerns about preserving indigenous forests emerged especially during the 1970s (the plan to log South Island beech forests was a flash point), leading to the creation of an ENGO called the Native Forest Action Council (NFAC) in 1975. The next fifteen years were characterized by a series of protests around planned logging sites of indigenous species. Spearheaded by NFAC, the protests also involved international ENGOs such as Greenpeace. From the mid-1980s, the new Labor Government began to placate protestors by signing a series of local accords. The culmination in 1991 was the New Zealand Forest Accord signed between representatives of industry and twelve ENGOs. The gist was that ENGOs would recognize the right of industry to manage and cut exotic forest plantations without interference, while industry would agree not to replace native forests with plantations. This agreement effectively ended the "war in the woods" between environmentalists and industry. By 2004, only 0.1 percent of logging involved indigenous species from native forests.

Finally, there was a similar placating of Maori concerns. In both the earlier deforestation and later reforestation phases that occurred after European settlement, the Crown had all but ignored the Treaty of Waitangi. However, the 1975 Treaty of Waitangi Act, which allowed for the creation of the Waitangi Tribunal, for the first time began to deal systematically with violations involving illegal appropriation of Maori land and resources. Initially, the Tribunal dealt with claims arising only after 1975, but the Labor Government changed the law in 1985 to allow any claim dating back to 1840. Claims are submitted to the Tribunal and are binding. The Tribunal has already made a series of large awards to claimants, in both cash and land, making some Maori groups wealthy, and providing capital for what have become multinational businesses. Although a complex process, Maori have been given back both native forest and planted forest holdings. They already own one-third of New Zealand's indigenous forests and 14 percent of plantation land holdings, which are expected to increase to over 40 percent when all claims are settled.

Beginning with a similar set of institutional arrangements, and an economy also based on staples production of forest products, the local model that has developed in New Zealand over the last twenty-five years has turned out quite differently from BC's. Rather than war in the woods, it is more like peace in the woods. It is an entirely different local model.

Tasmania, Australia. In Tasmania's case, ENGOs have been the main new force contesting the old export-based staples model articulated by government and industry. Aboriginal concerns now have higher profile and shape routine forestry practices but do not affect strategic directions.

In the 1970s, Tasmania's industrial forestry regime was both intensified and refocused by large-scale investments in wood chip exports to Japan. Industry and government leaders simply saw such exports as a continuation of industrial forestry with the added benefit of gaining export income. Three capital-intensive mills were built, involving bigger concessions than before, more extensive clear-cutting, and greater investment in roads. These initiatives, however, were soon faced by a new political force in Tasmanian forestry, as it was in BC and New Zealand, the environmental movement.

Opposition to the destruction of wilderness in Tasmania was kick-started, not by a forestry issue, but by the Franklin River hydropower dam project proposed in the late 1960s, opposition to which was first led by a few conservationists and then by the Tasmanian Wilderness Society (TWS). The dam was successfully stopped and in 1974, the Federal Government passed environmental impact assessment (EIA) legislation. Environmental opposition to industrial forestry that shortly followed focused on the destruction of eucalyptus forests for chip exporting, led by the Forest Sector Network formed in 1984. That opposition rapidly became confrontational (perhaps the best known example is in the Styk Valley). ENGOs were primarily motivated by desires to preserve old growth eucalyptus, and were especially incensed by large-scale clear-cutting of old growth and its replacement with fast growing plantations.

The impact of environmentalism on forest policy in Tasmania, beyond the EIA, has been substantial. The Forest Practices Act of 1985 established the basis for Tasmania's approach to sustainable forestry and was revised four times between 1994 and 2002. A Forestry Practices Code was introduced in 1987 (revised in 1993 and in 2000), and the Threatened Species Act was introduced in 1995. In western Tasmania, the substantial Tasmania Wilderness of almost 1.4 million hectares (not all forested) gained world heritage status in 1982, and was further extended in 1989 by the Lemnathyme and Southern Forest Areas. Indeed, of the State's 3.4 million hectares of forests, 39 percent is in formal reserves, and the remainder is more or less evenly split between private and public multiple-use forest. Further, clear-cutting of old growth has been greatly reduced and is to be phased out entirely over the next five to ten years. Many new plantations have been cultivated on agricultural land, and through a "Good Neighbor Charter," cooperation among farmers, tree-planting businesses, and government is encouraged.

More generally, the local state in Tasmania has sought to maintain its traditional alliance with big business, while at the same time placating ENGOs by supporting investments in exotic plantation forestry, including on former agricultural land, to provide fiber for industry while preserving old growth to meet environmental values. The government's recent (2005) announcement for a new pulp mill in northern Tasmania indicates continued strategic commitment to the "old" commodity-based export staple model. Indeed, Tasmania's forest economy is still dominated by large firms, notably the locally based Gunns Ltd., which is the biggest producer of hardwood chips in the world. Gunns owns all the wood chip export mills in Tasmania, two-thirds of the hardwood sawmilling industry, and 13 percent of the State's private forests. Through the turmoil of the past twenty years, Gunns has consolidated its position as the dominant corporate power in the Tasmanian forest economy.

Meanwhile, ENGO opposition to old growth forestry remains adamant, and does not accept government claims that forestry has become sustainable and that native forests are effectively protected. Rather, ENGOs point to the continued conversion of old growth to plantations that effectively shifts forests to industry's orbit. Greenpeace and the TWS continue to operate a "Global Rescue Station" (tree house) to call global attention to the threatened logging of the Styx Valley for wood chips, and for the subsequent use of chemicals and poison that will eradicate wildlife and fauna. Instead of large-scale and export-oriented forestry, they have allied themselves to small-scale value-added manufacturing based on selective logging that they claim has a greater job potential. However, sympathetic to one another, small firms and ENGOs have not formed an effective alliance in Tasmania. There is also no particular bonding between ENGOs and Aboriginal Peoples in Tasmania in part because the latter's concerns are not expressed as land claims on a large scale. Moreover, the state has increasingly addressed aboriginal issues. Regulations forbid the harvesting of planted trees in the immediate vicinity of aboriginal artifacts, no matter how small.

In summary, Tasmania's evolving local model for forestry differs from the situations in BC and New Zealand. ENGO controversies remain more strident than those in New Zealand because the plantations are still recent and linked to the loss of old growth in one way or another. Nevertheless, it may be anticipated that as in New Zealand, the separation of old growth and plantation forestry will eventually contribute to some kind of environmental peace in the woods in a way that may not happen in BC, ironically in part because of the latter's emphasis on replacing the original forests with the same species. In Tasmania, as in BC, ENGO opposition has not been congratulatory of the green responses by the local state. Tasmania's attempts to green forest policy have been based on encouraging cooperative and trusting behavior by industry. If ENGOs are skeptical of such an approach, it is worth noting that in BC, ENGOs were critical of the heavily prescriptive approach by BC's government to sustainable forest policy in the 1990s. In all three regions, the idea that small-scale value-added industry can replace the old staple model emphasis remains problematic.

Conclusion

This article is clearly much more of a set of agenda for future work than a polished set of research findings. In large part, it stemmed from frustrations with the conventional literature in economic geography for understanding resource peripheries. The problem, to use terms introduced earlier, was a disjunction between the supposedly universal character of conventional models and their neat delineations and the messy local particularities that were encountered in the studies of staples-producing regions. What was needed was a different kind of modeling tradition, one that could be sensitive to the peculiarities of resource peripheries and their blurring of sharp distinctions. In resource peripheries, the "economic" can only be properly understood by explicit inclusion of political, environmental, and cultural forces.

The attempt was to develop that alternative through the notion of a local model. While the term itself might be new, in this case it draws upon the well-established tradition of

institutional economics. With that said, it is not simply equivalent to institutional economics because of our emphasis on geographical difference. Here, the interest is less in institutions in and of themselves, than how they operate and intersect *geographically*, forming quite different local models. It is the local part of the term that most interests the present study.

In these three regional case studies, the same general institutional forces are seemingly at work, except of course they are not the same. Their very local boundedness in conjunction with their intersection with other local-bounded institutions have created radically different models of the forest economy: (1) war in the woods, (2) peace in the woods, and (3) almost business as usual. Furthermore, the different models cannot be easily disassembled, divided neatly into conventional categories like economy, politics, culture, and environment. Rather, they are thoroughly mixed up and muddled together within a given place.

This example of the usefulness of local models pertains to resource economies. It is the substantive case we know best. But there is no reason to think that local models are restricted in application to only this type of economy. Certainly, Veblen's work belies this idea. Furthermore, within economic geography, there is an increasing recognition that regionally specific economic and noneconomic institutional conjunctions create different local models even for metropole (core) activities. Take for example, Gertler's (2004) work on various components of the high-tech sector and innovation systems. In comparing specifically the economies of Canada and Germany, he is interested in how different conjunctions of institutions such as state regulation, educational norms and practices, and corporate cultures make for in effect different local models, with very different outcomes. As in this study, the same basic institutional elements are found in different jurisdictions, but how they are configured in place produces regionally specific effects. Moreover, also like the present study, Gertler is concerned to show how the economy is never pure, but is always thoroughly tangled and enmeshed within the noneconomic. Gertler uses the term "culture" to signal this tangling and enmeshment, but it is better to talk about assemblages or even hybrids to emphasize the sometimes quite different kinds of forces at work, which produce such distinctive local models (Barnes 2005). Culture implies singularity, whereas this article stresses multiplicity and variety. The larger point, then, is that local modeling need not be confined to resource economies, and may be applied to activities found at the very heart of core regions.

With that said, as an approach local modeling is likely to upset those who are concerned to bring greater clarity, rigor, and quantification to the study of regional and local economies. For local modeling, as described here, has no fixed template and has no set of off-the-rack procedures to follow. In this sense, it is quite unlike universal modeling, which at least in economics follows a very strict hierarchy of steps, and is ordered by the disciplinary logic of mathematics. Certainly, Krugman (1995: 85) would not be sympathetic to this proposal (he derisively calls discussions of even post-Fordism "deconstructionist geography!"). Others like Markusen (1999) would likely see this proposal as an example of "fuzzy concepts," and Scott (2004) as embodying an antiquantitative impulse. But these

potential criticisms go to a key point in our proposal: its openness. Methods, key concepts, central relationships, and even the domain of inquiry are not fixed ahead, but require working out within the context of the case. This is what makes it so challenging and difficult. We are certainly not ruling out formal methods, conceptual purity, statistical analysis, or logical rigor. But it is not necessary to bring to every study the same methodological and conceptual apparatus, which is certainly the case with Krugman, and maybe Markusen and Scott as well.

Even within the hard sciences, including physics, there is an increasing recognition by philosophers and practitioners that different kinds of phenomena require their own methods and peculiar models—that one shape does not fit all. The philosopher of physics, Nancy Cartwright (1999), speaks about a “dappled world” rather than a singular one; Ian Hacking (2002) is concerned about “styles” in the plural of “scientific reasoning;” and Peter Galison and David Stump (1993) recognize a “disunity of science.” These are only brief indicative cases. They suggest, though, that the natural science method, which has been the basis for universal models of the kind that social sciences have long adopted, is being rethought, that the method is less universal and prescribed than it was once believed to be. A similar claim is being made here. The geographical world is indisputably varied; there is no one-size-fits-all model. Local models allow for an entrance into that dappled geographical world.

REFERENCES

- Barager, F. 1996. The influence of Thorstein Veblen on the economics of Harold Innis. *Journal of Economic Issues* 30: 667–684.
- Barnes, T.J. 1999. Industrial geography, institutional economics, and Innis. In *The new industrial geography: Regions, regulations, and institutions*, ed. T.J. Barnes and M.S. Gertler, 1–22. London: Routledge.
- . 2005. Culture: Economy. In *Spaces of geographical thought*, ed. P. Cloke and R. Johnston, 61–80. London: Sage.
- Barnes, T.J., and R. Hayter, eds. 1997. *Troubles in the rainforest: British Columbia's forest economy in transition*. Victoria, BC, Canada: Western Geographical Press.
- Barnes, T.J., R. Hayter, and E. Hay. 2001. Cyclones, Harold Innis, and Port Alberni, British Columbia. *Environment and Planning A* 33: 2127–2148.
- Berger, C. 1976. *The writing of Canadian history. Aspects of English-Canadian historical writing: 1900–1970*. Toronto, ON, Canada: Oxford University Press.
- Cartwright, N. 1999. *The dappled world: A study of the boundaries of science*. Oxford, UK: Clarendon.
- Dargavel, J. 1995. *Fashioning Australia's forests*. New York: Oxford University Press.
- Dugger, W.M. 1992. *Underground economics. A decade of institutional dissent*. Armonk, NY: M.E. Sharpe.
- Galison, P., and D.J. Stump 1993. *The disunity of science: Boundaries, contexts and power*. Stanford, CA: Stanford University Press.
- Gertler, M.S. 2004. *Manufacturing culture: The institutional geography of industrial practice*. Oxford, UK: Oxford University Press.

- Gudeman, S., and M. Penn. 1982. Models, meaning and reflexivity. In *Semantic anthropology*, ed. D. Parkin, 89–106. London: Academic Press.
- Hacking, I. 2002. *Historical ontology*. Cambridge, MA: Harvard University Press.
- Hayter, R. 2000. *Flexible crossroads: The restructuring of British Columbia's forest economy*. Vancouver, BC, Canada: UBC Press.
- . 2003. "The war in the woods:" Globalization, post-Fordist restructuring, and the contested remapping of British Columbia's forest economy. *Annals, Association of the American Geographers* 93: 706–729.
- . 2004. Economic geography as dissenting institutionalism: The embeddedness, evolution and differentiation of regions. *Geografiska Annaler B* 86: 95–115.
- Hayter, R., T.J. Barnes, and M.J. Bradshaw. 2003. Relocating resource peripheries to the core of economic geography's theorizing: Rationale and agenda. *Area* 35: 15–23.
- Innis, H.A. 1956. The teaching of economic history in Canada. In *Essays in Canadian economic history*, ed. M.Q. Innis, 3–16. Toronto, ON, Canada: University of Toronto Press.
- Krugman, P.R. 1990. *The age of diminished expectations: US economic policy in the 1980s*. Cambridge, MA: MIT Press.
- . 1995. *Development, geography, and economic theory*. Cambridge, MA: MIT Press.
- LeHeron, R., and M. Roche. 1985. Expanding exotic forestry and the extension of a competing use for rural land in New Zealand. *Journal of Rural Studies* 1: 211–229.
- Markusen, A. 1999. Fuzzy concepts, scanty evidence, policy distance: The case for rigor and policy relevance in critical regional studies. *Regional Studies* 33: 869–884.
- Mayhew, A. 1988. The beginnings of institutionalism. In *Evolutionary economics volume 1: The foundations of institutional thought*, ed. M.R. Tool, 21–48. Armonk, NY: M.E. Sharpe.
- Moore, W.E. 1963. *Social change*. Englewood Cliffs: New Jersey: Prentice Hall.
- Nietschmann, B. 1997. Protecting coral reefs and sea territories, Miskito Coast, RAAN, Nicaragua. In *Conservation through cultural survival: Indigenous peoples and protected areas*, ed. S. Stevens, 193–224. Washington, DC: Island Press.
- Patterson, G. 1990. *History and communications: Harold Innis, Marshall McLuhan, the interpretation of history*. Toronto, ON, Canada: University of Toronto Press.
- Posey, D., ed. 1999. *Cultural and spiritual values of diversity*. London: Intermediate Technology.
- Scott, A.J. 2004. A perspective of economic geography. *Journal of Economic Geography* 5: 479–499.
- Stamps, J. 1995. *Unthinking modernity: Innis, McLuhan, and the Frankfurt School*. Montreal, QC and Kingston, ON, Canada: McGill-Queen's University Press.
- Veblen, T. 1919. *The place of science in modern civilisation and other essays*. New York: B.W. Huebsch.
- . 1957. *The higher learning in America: A memorandum on the conduct of universities by business men*. New York: Hill and Wong.
- . 1973. *The theory of the leisure class*. Boston, MA: Houghton Mifflin.