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Paul Krugman's Geographical Economics and Its Implications for Regional Development Theory: A Critical Assessment*

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Abstract: Economists, it seems, are discovering geography. Over the past decade, a "new trade theory" and "new economics of competitive advantage" have emerged which, among other things, assign a key importance to the role that the internal geography of a nation may play in determining the trading performance of that nation's industries. Paul Krugman's work, in particular, has been very influential in promoting this view. According to Krugman, in a world of imperfect competition, international trade is driven as much by increasing returns and external economies as by comparative advantage. Furthermore, these external economies are more likely to be realized at the local and regional scale than at the national or international level. To understand trade, therefore, Krugman argues that it is necessary to understand the processes leading to the local and regional concentration of production. To this end he draws on a range of geographical ideas, from Marshallian agglomeration economies, through traditional location theory, to notions of cumulative causation and regional specialization. Our purpose in this paper is to provide a critical assessment of Krugman's "geographical economics" and its implications for contemporary economic geography. His work raises some significant issues for regional development theory in general and the new industrial geography in particular. But at the same time his theory also has significant limitations. We argue that while an exchange of ideas between his theory and recent work in industrial geography would be mutually beneficial, both approaches are limited by their treatment of technological externalities and the legacy of orthodox neoclassical economics.

Key words: Krugman, trade, external economies, regional industrial concentration, regional industrial policy.

The relationship between economic geography and economics has long been an asymmetric one. In constructing their theories and explanations of regional development, economic geographers have

drawn freely on the concepts and perspectives of different schools of economics; but, for their part, economists have tended to accord little if any attention to the role of geography in the economic process. The case of trade theory admirably illustrates this point. Regional devel-

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opment theory has always been concerned with the question of interregional trade, because a region's ability to export goods and services is one of the foundations of local economic growth and employment (Erickson 1989). The typical approach to the study of interregional trade has been to borrow and adapt the ideas and models of comparative advantage (factor endowment) trade theory from economics. Trade economists, however, have invariably regarded the national economy as spaceless, and even international trade typically has been seen as an exchange system devoid of any geography, a world where goods and services move between dimensionless points at zero or uniform transport costs. This lack of a sensitivity to geography by trade theorists partly explains why there is no overall theoretical framework guiding geographical research on international trade (Grant 1994). The absence of such a framework is particularly evident at a time when the "globalization" of economic relations and the continental regionalization of trade are challenging the territorial and regulatory significance of national economic spaces and giving greater prominence to the nature and performance of individual regional and local economies within nations (Dunford and Kafkalas 1992; Anderson and Blackhurst 1993; Gibb and Michalak 1994).

Recently, however, there have been developments within economics which may mark the beginning of a closer relationship with economic geography in general and regional development theory more particularly. Over the past decade, a "new" trade theory and a new economics of competitive advantage have emerged which, among other important features, assign a key significance to the role that the internal geography of a nation may play in determining the trading performance of that nation's industries.¹ Econo-

mists, it seems, are discovering geography. In particular, Paul Krugman, the leading and extraordinarily prolific exponent of the "new" trade theory,² has sought to show how trade is both influenced by and in turn influences the process of geographical industrial specialization within nations (for example, Krugman 1991a). In his view, the importance of regional industrial specialization and concentration is such that economic geography should be accepted as a major subdiscipline within economics, "on a par with or even in some senses encompassing the field of international trade" (Krugman 1991a, 33). Likewise, from a different, but ultimately related perspective, Michael Porter, the eminent business economist, has argued that the degree of geographical clustering of industries within a national economy plays an important role in determining which of its sectors command a competitive advantage within the international economy (Porter 1990). In a similar vein to Krugman, Porter also argues that there are strong grounds for making economic geography a "core discipline in economics" (Porter 1990, 790).

Paul Krugman's work, especially, is worthy of closer interest by geographers. Krugman has written on a wide range of issues that impinge on the regional development question: trade, externalities, the localization of industry, strategic industrial policy, globalization, the role of history and "path dependence," and the implications of economic and monetary integration for regional growth. One of the key thrusts of his work is that in order to understand trade we need to understand the process of regional development within nations. A number of his writings have thus sought to explain why industrial development is likely to be geographically

Lancaster (1980), Krugman (1979, 1980, 1981), Ethier (1982), and Helpman (1984).

² Such has been Krugman's influence within the economics profession that Paul Samuelson (1994, vii) refers to him as "the rising star of this century and the next."

¹ The set of ideas referred to as the "new trade theory" was originally expounded in a series of papers by Dixit and Norman (1980),

uneven. To this end, he draws on a range of economic and geographical ideas, from Alfred Marshall's account of localization economies, through traditional location theories, to notions of cumulative causation. For Krugman, economic geography—by which he means uneven regional development—is a central part of the process by which national economic prosperity and trade are created and maintained.

Our aim in this paper is to provide a critical assessment of Krugman's "geographical economics" and its implications for contemporary economic geography. An exchange of ideas between his theory and recent work in economic geography would be mutually beneficial. Such an exchange is not easy to engineer, however, as there are several significant obstacles, on both sides. First, Krugman's ideas are far from static. Indeed, his views seem to change continuously over time—sometimes in a self-criticizing way—so it is important to base any evaluation on a range of his works. Second, throughout Krugman's writings there is a strong distinction between what is theoretically possible and what is empirically and practically important, so that his conclusions have to be read carefully and closely. Most important, however, Krugman's geographical economics and contemporary economic geography are very different academic genres, with different methodological styles and conventions of analysis and writing (Krugman 1993a). Krugman's method is to start with a real world problem and then build a model to capture the "essence" of that problem (Krugman 1989, 1992). The model, which is usually mathematically specified, is made as simple as possible to remove unnecessary clutter, although in most cases he also gives a highly readable narrative account of the model. The mathematical aspect of his methodology may well explain the strong location-theory flavor to much of his geographical

economics.³ However, this methodological and theoretical disposition is unlikely to appeal to many economic geographers, who have abandoned formal models and rigorous exegesis for a more discursive approach, in which broad master concepts (like "flexible specialization" and "post-Fordism") are mingled with anecdotal spatial stereotypes ("industrial spaces" and "industrial districts").

These differences probably largely explain why Krugman's writings have thus far had a limited impact on economic geography, and why they have been summarily dismissed by certain geographers. Johnston (1992) dismisses Krugman's *Geography and Trade* (1991a) as "highly simplistic" in its treatment of "geography" and "patronizing" in its comments on the work of economic geographers.⁴ In a somewhat similar vein,

³ This location-theory orientation has if anything become even more pronounced in his two most recent books on "spatial economics," *Development, Geography and Economic Theory* (Krugman 1995) and *The Self-Organising Economy* (Krugman 1996). In the former, lamenting economic geographers' "retreat" from quantitative models into Marxist and regulationist concerns with "post-Fordism," Krugman resurrects what he calls the five "exiled traditions" of economic geography: location theory, social physics, cumulative causation, land use modeling, and Marshallian local external economies. In the latter, von Thunen's model and central place theory occupy a key role in his theorization of the "self-organizing" space economy.

⁴ It is not difficult to see how economic geographers might take offense at Krugman's view of their work. In *Geography and Trade* (1991a, 3–4) he writes: "The decision by international economists to ignore the fact that they are doing geography wouldn't matter so much if someone else were busy . . . looking at localization and trade within countries. Unfortunately, nobody is. That is, of course an unfair statement. There are excellent economic geographers out there. . . . However, . . . economic geographers proper are almost never found in economics departments, or even talking to economists. . . . They may do excellent work,

in his review of the same book, Hoare (1992, 679) criticizes the particular economic geography used by Krugman as "dated, historically and intellectually" and his analysis as based on the "flimsiest of empirical support." However, Krugman's remarks are leveled primarily at his own colleagues' failure to admit that "space matters" (Krugman 1991a, 8), and he should at least be congratulated for wanting "to bring geography back into economic analysis," even if the particular form of geography he uses—essentially a form of regional science—is open to criticism. Furthermore, *Geography and Trade* gives only a partial glimpse into Krugman's analyses, and any considered judgment as to the significance of Krugman's work for economic geography must also be based on his numerous other writings in the field.

We too have criticisms to make of Krugman's treatment of economic geography, although we also believe that his work raises some interesting issues for contemporary regional theory. We begin by outlining what we take to be the essential arguments and components of his "geographical economics," focusing on his interpretation of the relationships between location and trade, the role of increasing returns and externalities in the localization of industry, and the signifi-

but it does not inform or influence the economics profession." It could equally be argued, of course, that it is the economists who have failed to talk to economic geographers and that, as a result, like Krugman they are largely ignorant of the major developments that have taken place in economic and industrial geography over the past decade or so. Equally irritating is Krugman's comment, in *Development, Geography and Economic Theory* (1995, 88), that "in the end, we [i.e., economists] will integrate spatial issues into economics through clever models (preferably but not necessarily mine) that make sense of the insights of the geographers in a way that meets the standards of the economists." Whether economists have any such monopoly over analytical or theoretical standards may most certainly be questioned.

cance of history, "lock-in," and path dependence for regional development. The subsequent section examines these ideas in closer, more critical detail, and compares Krugman's theories with those that have emerged from the "new industrial geography" in the past few years. We then examine his arguments about the impact of economic integration on regional development, especially his prognoses of the regional implications of integration within the European Union and his views on regional stabilization and industrial policy. We conclude the paper by drawing together the main strengths and weaknesses of Krugman's approach to economic geography.

Trade, Externalities, and Industrial Localization: The Bases of Krugman's "Geographical Economics"

The New Trade Theory and Location

Krugman's geographical economics and theorization of uneven regional development are firmly rooted in his contributions to the "new trade theory." Conventional trade economics is based on Ricardian comparative advantage theory (especially in its Heckscher-Ohlin-Samuelson versions), which argues that under conditions of perfect competition, and given the relative immobility of one or more factors of production, nations will specialize in those industries in which they have comparative factor advantages (favorable resources of raw materials, cheaper labor, and so forth). The relative factor endowments of different nations is thus the main reason for international trade and specialization. The principle of comparative advantage, then, predicts that countries with dissimilar resource endowments will exchange dissimilar goods. The theory does not and cannot, however, predict what sort of goods will be exchanged by countries that have similar resource endowments. But much of world trade, and most of Organization for Economic Cooperation and Develop-

ment (OECD) trade, is between countries with similar factor endowments, and they exchange predominantly similar products. Such *intraindustry* trade has been expanding rapidly in recent decades, even though countries have been converging in skill levels and per capita endowments of capital (OECD 1994). The "new trade theory" is an attempt to account for this form of trade. The new trade theory acknowledges that differences among countries are one reason for trade, but it goes beyond the traditional view in four main ways (Krugman 1990).⁵

First, it argues that much trade between countries, especially intraindustry trade between similar countries, represents specialization to take advantage of *increasing returns to scale* rather than to capitalize on inherent differences in national factor endowments. Contrary to the assumptions of perfect competition and constant returns to scale that underpin the basic Ricardian theory of comparative advantage and trade, according to the new theory *imperfect* competition and *increasing* returns are pervasive features of contemporary industrial economies.⁶ If specialization and trade are driven by increasing returns and economies of scale rather than by comparative advantage, the gains from trade arise because production costs fall as the scale of output increases. Second, with this view of the world, specialization is to some extent a historical

accident. The specific location of a particular microindustry is to a large degree indeterminate, and history-dependent. But once a pattern of specialization is established, for whatever reason, that pattern gets "locked in" by the cumulative gains from trade. There is thus a strong tendency toward "path dependence" in the patterns of specialization and trade between countries: *history matters*. Third, the patterns of demand for and rewards to factors of production under conditions of imperfect competition and intraindustry trade will depend on the *technological conditions* of production at the micro level, and nothing can be said a priori about the evolution of factor demands. Fourth, whereas under the Ricardian model free trade is assumed to be the appropriate policy stance, the new trade theory argues that the existence of imperfect competition and increasing returns opens up the possibility of using trade policies *strategically* to create comparative advantage by promoting those export sectors where economies of scale—and particularly external economies—are important sources of rent. In other words, strategic trade policy may enable a nation to shift the pattern of international economic specialization in its own favor (Krugman 1980).

In Krugman's view, these developments in the "new trade theory" both necessitate and facilitate a rapprochement between trade theory and location theory. In recent work he has compared the contrasting assumptions underlying these two, hitherto largely separate, sets of economic literature (Krugman 1993a). His geographical economics is a hybrid of the two. It combines the models of imperfect competition and scale economies used in new trade theory with location theory's emphasis on the significance of transport costs. The interaction of external economies of scale with transport costs is the key to his explanation of regional industrial concentration and the formation of regional "centers" and "peripheries" (Krugman 1991a; Krugman and Venables 1990). His model suggests that high

⁵ There are in fact several different versions of the new trade theory, but the various strands all subscribe to the basic elements elaborated by Krugman in his *Rethinking International Trade* (1990).

⁶ Of course, the idea that increasing returns and economies of scale could be alternatives to comparative advantage as explanations of international specialization and trade goes back to Ohlin (1933), if not to Adam Smith. But while their importance has been recognized in principle, they invariably have been assigned a subsidiary or supplementary role in formal trade theory. The novelty of the "new trade theory" is that increasing returns and economies of scale are moved into the mainstream.

transport costs will act to prohibit the geographical concentration of production. With some reduction in transport costs, however, firms will want to concentrate in one site to realize economies of scale both in production and in transport. In Krugman's words, "Because of the costs of transacting across distance, the preferred locations for each individual producer are those where demand is large or supply of inputs is particularly convenient—which in general are the locations chosen by other producers" (1991a, 98). If transport costs continue to fall, the model suggests that the need to locate near to markets will disappear and production may disperse. However, given that some transport costs will remain, the circular relation, or positive feedback, between production and demand means that regions which have a head start in manufacturing, typically as a result of accidental good fortune, will attract industry and growth away from regions with less favorable initial conditions. Krugman (1991a, 1991d) argues that this model explains the rise of the manufacturing belt in the Northeastern United States during the nineteenth century. It has also been applied to the discussion of the likely fate of peripheral regions in the European Union (Krugman and Venables 1990). Recently, Krugman (1993d) has developed a new variant of the approach which argues, not that successful regions systematically attract industry away from peripheral areas, but that trade and external economies produce more-specialized regions, which are then more vulnerable to random "shocks."

On the basis of this location model, Krugman (1993b) argues that large-scale regions are more significant economic units than nation-states. He writes that a satellite image of the world at night shows regional agglomerations rather than national concentrations. Furthermore, in his view, "The best evidence for the practical importance of external economies is so obvious that it tends to be overlooked. It is the strong tendency of both economic activity in general and of particular

industries or clusters of industries to concentrate in space" (Krugman 1993b, 173). This tendency, he argues, provides a decisive refutation of the competitive model of economic equilibrium, for when one turns to the location of production in space the "irrelevance of equilibrium economics" is compelling and there are multiple possible equilibria. An economy's form is determined by contingency, path dependence, and the initial conditions set by history and accident. Forward and backward linkages mean that once an initial regional advantage is established it may become cumulative. There is therefore no automatic tendency toward an optimum solution, as apparently "irrational" economic distributions may be "locked in" through increasing returns. So that while Krugman associates economic geography with path dependence, or what he calls "the economics of qwerty,"⁷ he does not neglect the possibility of reversal and change. Rather, he argues that when change in regional fortunes occurs it will be sudden and unpredictable. He repeatedly uses the example of Massachusetts as a regional economy that has gone into a tailspin. Krugman (1991c) suggests that, under certain conditions, self-fulfilling expectations may outweigh accumulated advantages, and pessimistic expectations about a region's prospects may become self-justifying.

Increasing Returns and Imperfect Competition

According to Baldwin (1994), Krugman's analysis represents a genuinely new location theory. In actuality, not only does

⁷ This term derives from the first line of letters (QWERTYUIOP) on the keyboard of a typewriter or word processor. That this order is the same today as it was on the first mechanical typewriters of the nineteenth century, even though more efficient sequences are possible, represents a form of "lock-in" and persistence that has analogous parallels in the economy.

it echo Ohlin (1933), Hirschman (1958), and Myrdal (1957), it strongly resembles Weber's (1929) model of the overlaying of transport costs on agglomeration economies. Whereas Weber identified spatial overlaps, the Krugman-Venables model adds the general level of transport costs as a variable that can fluctuate over time. Given these predecessors, we should consider whether there is anything really new in Krugman's geographical economics. In several places he himself states that he is simply retelling an old story in a more rigorous way. It would be tempting to conclude, as some critics have done, that there is nothing new in this. However, this conclusion overlooks the way in which Krugman's reading of agglomeration has been shaped both by the developments in trade theory and by recent models of industrial organization. One of the main reasons for trade theory's traditional neglect of the advantages which arise from increasing returns and economies of scale was the difficulty of modeling market structure. In one sense, recent developments in modeling market structure with nonconstant returns have facilitated the new trade theory (Helpman 1984; Krugman 1983a; Buchanan and Yoon 1994; Smith 1994). Hence the best place to start, in order to understand Krugman's interpretation of increasing returns, is with these models. Two approaches are particularly relevant to Krugman's account of geographical concentration, namely the Marshallian and Chamberlinian models.

The Marshallian approach to understanding increasing returns is already familiar in economic geography. It is based in a long tradition that sees economies of scale as primarily external, as arising from the specialization of the social division of labor (Young 1928; Stigler 1951). Typically, economies of scale have been taken to be purely external, so that the assumptions of perfect competition may be retained (Chipman 1970). While Krugman is aware of this long tradition, he suggests that recent advances in the modeling of such

external economies (see, for example, Romer 1990) have given them a new tractability. He argues, in one paper (Krugman 1981), that external economies at a national level are the key to the uneven development of countries. Yet, increasingly, Krugman has been reluctant to treat nations as economic units and has emphasized the significance of external economies at a local and regional scale. Indeed, in *Geography and Trade* his account of the localization of industries and agglomeration at a relatively small scale is based on Marshall's three types of external economy: labor market pooling, the availability of specialist suppliers, and the presence of technological knowledge spillovers. However, he places greater emphasis on the first two of these and deals only briefly with local technological externalities. This might seem strange given that elsewhere he has argued that, empirically, the most plausible source of positive externalities from trade is the inability of innovative firms to monopolize the knowledge they create (Krugman 1987a, 137). But the arguments are not incompatible, for Krugman argues that these externalities are difficult to measure and track and that many of them are national or international in scope (see also Ethier 1982). So while local technological externalities are important in some high-tech districts, he considers their general locational significance to be limited.

Further reasons for Krugman's lack of emphasis on technological spillovers become apparent when we turn to the second model of market structure that has been influential in new trade theory, namely the Chamberlinian model (Chamberlin 1949). This model of market equilibrium envisages competition among similar firms producing differentiated products which are close but not perfect substitutes. Each firm faces a downward sloping demand curve and has some monopoly power. The entry of new firms producing slightly different products eliminates monopoly profits and means that there are many little monopolists. Many explanations of intraindustry trade

by new trade theorists have been developed from this model, with the assumption of economies of scale that are internal to firms.⁸ According to Helpman and Krugman (1985), these internal economies are easy to justify. They argue that firms could both achieve economies of scale and meet a demand for differentiated products from other producers and consumers by locating at one site and engaging in intraindustry trade (Krugman 1989). Krugman sees this approach as especially relevant to intermediate products and components, where the scope for differentiation is high and the market often too small for an exhaustion of scale economies. Moreover, he argues that

where intermediate goods produced with economies of scale are not tradeable, the result will be to induce the formation of "industrial complexes"—groups of industry tied together by the need to concentrate all users of intermediate goods in the same country. In this case the pattern of specialisation and trade in the Chamberlinian world will come to resemble the pattern in the Marshallian world described previously. (Krugman 1987c, 319; compare Losch 1967, 109)

Both of these models of competition are implicit in Krugman's discussion of regional and local externalities.

The Role and Implications of Externalities

Krugman uses Marshall's theorization of external economies to explain geographical clustering at a relatively small scale, that of urban specialization and city agglomerations. However, the Chamberlinian approach has been equally important to his account of externalities. In Krugman's view, the presence of increasing returns implies that the orthodox

divide between "technological" and "pecuniary" externalities is misleading and unhelpful.⁹ In the competitive equilibrium model, technological externalities are defined as those consequences of activity which directly influence the production function in ways other than through the market. They have real welfare and efficiency consequences (Meade 1952; Mishan 1971). In a situation of perfect competition and constant returns, however, pecuniary externalities which arise through buying and selling in the market are scarce (Scitovsky 1954). Krugman argues that this type of distinction is misleading. In his words, "It is valid only when there are constant returns and perfect competition; in a world of increasing returns and imperfect competition, the range of significant external economies is much larger. In particular, there are true external economies associated with a variety of market-size effects" (Krugman 1993b, 166). In summary, there are increasing returns in production, so that the size of the market matters and pecuniary economies also have real welfare significance. Elsewhere Krugman writes,

Over the past decade . . . it has become a familiar point that in the presence of imperfect competition and increasing returns, pecuniary externalities matter; for example, if one firm's actions affect the demand for the product of another firm

⁸ Hanink (1988, 1994) describes these approaches as the theory of differentiated markets, and uses an extended Linder model to explain the consequences of geographical product differentiation.

⁹ The term "pecuniary externalities" was used by Scitovsky (1954) to refer to externalities arising from market imperfections of both demand and supply. Market-size effects are an important form of pecuniary external economy; the larger the market, the more individual firms can increase their output without having to cut prices. Increasing market size permits increasing returns. Such market-size effects may operate at various geographical scales, from the international to the local. Technological externalities refer to the situation where there are spillovers from the production function of one firm into those of other firms, for example when a firm makes an innovation that other firms can imitate.

whose price exceeds marginal cost, and this is as much a "real" externality as if one firm's research and development spills over into the general knowledge pool. At the same time, by focusing on pecuniary externalities, we are able to make the analysis much more concrete than if we allowed external economies to arise in some invisible form. (Krugman 1991b, 485)

This focus on pecuniary externalities shapes Krugman's interpretation of Marshall (see also David and Rosenbloom 1990). For instance, he claims that both labor market pooling and the availability of nontraded intermediate goods are examples of market-size effects.¹⁰ Moreover, he emphasizes "pecuniary" externalities which are derived from both external and internal economies of scale. As he notes, "Even if economies of scale are internal to firms, internal economies in the production of intermediate inputs can behave like external economies for the firms which buy them" (Krugman 1981, 151). Furthermore, in a recent paper on metropolitan location (Krugman 1993c), he demonstrates that the "centripetal forces" which hold a city together can be derived from the interaction of economies of scale at the plant level with transport costs. Thus, he argues, local external economies do not have to be assumed; instead, they are again derived from market-size or market-potential effects. The key point to note about these arguments is that internal economies of scale, by increasing the incentive for firms to concentrate on one site, intensify the tendency toward the geographical concentration of production. Thus Krugman associates the rise of the North American manufacturing belt with the rise of the Chandlerian corporation.

Krugman's analysis emphasizes that externalities operating within and between industries in these regional agglomerations make a difference to the

competitive advantage of the constituent firms. In this sense, then, Krugman's work conveys a sense of regional competitiveness.¹¹ At the same time, his recent writings on the international economy have criticized certain popular definitions and uses of competitiveness, and it is important to set his regional work within the context of his more general understanding of the consequences of trade (Krugman 1994a, 1994b, 1994c, 1994d). The primary issue here is that Krugman sees all forms of international economic integration, including trade and capital and labor mobility, as essentially beneficial. For example, the specialization produced by trade raises the efficiency of the world economy as a whole and produces mutual benefits to the trading nations (Krugman 1994d). This view is partly founded on his belief that comparative advantage still remains important and useful. It is also based on his belief that the "new" trade theory's recognition of externalities and imperfect competition highlights the *potential gains* from economic integration. Increased trade may allow greater economies of scale through rationalization and, in other situations, it may have a beneficial effect on oligopolistic markets by increasing competition.

The complexity of much of Krugman's work also reflects the fact that the existence of significant externalities and nonconstant returns also opens up possible ways in which increased trade and integration may have adverse effects. Krugman (1989) highlights two main sources of adverse effects. The first is the possibility of the uneven distribution of benefits associated with the existence of excess returns in imperfectly competitive industries. A country that gains a disproportionate share of high-returns industries can gain at others' expense, raising the possibility that trade policies designed to

¹⁰ Krugman also praises Fujita (1989) for his emphasis on market-size effects as explanations of urban agglomeration.

¹¹ In a similar fashion, Porter (1990) argues that the geographical concentration of leading industries often reinforces and intensifies their competitive advantage.

foster these industries will lead to trade conflict. Hence, "While the possibility of actual losses from trade is probably purely academic, there is a real issue of conflict over the division of the gains" (Krugman 1989, 361). (For a global example, see Krugman and Venables 1994.) There is clearly also a regional dimension to this problem of uneven distribution. As a result of the importance of external economies and the accumulated, path-dependent advantages of certain regions, it is possible that these leading regions will capture a disproportionate share of the benefits of increased integration. A major obstacle to integration, in this view, is that its benefits are not equally shared across regions *within countries*.

This forms the basis of the second set of adverse consequences identified by Krugman, namely adjustment costs. He argues that although it is costly for capital and labor to shift into new industries, these costs represent a type of investment. They may be deserving of compensation, but they are not reasons to prevent or delay change. On the other hand, where these adjustments involve significant social costs, most importantly unemployment, he concedes that this may provide a case against moving too fast. The possibility of adjustment costs becoming real social costs should not be dismissed lightly. One ameliorating factor that Krugman notes is that the growth of trade between the industrialized nations since the Second World War, especially within Europe, has largely been intraindustry trade. "Thus the specialisation that took place as trade in manufactured goods grew tended to involve concentration on different niches within sectors rather than wholesale concentration of different countries on different industries" (Krugman 1989, 364). There is clearly a tension in Krugman's work between his positive evaluation of trade and integration in general and his demonstration that significant adverse consequences are possible. As we have seen, the question of uneven distribution of the benefits and costs is probably the most important of these. Indeed, while

Krugman's "geographical economics" shows the positive effects of agglomeration on productivity, it is also particularly well suited to explaining these possible adverse consequences.

Krugman's Geographical Economics and Economic Geography: A Critical Comparison

Clearly, Krugman shares an interest in regional agglomeration and the geographical consequences of trade with many economic geographers. At the same time, his treatment of these issues has been significantly different from the approaches pursued in economic geography in recent years. In this part of the paper we shall examine the most important of these differences and consider the lessons that Krugman and economic geographers can learn from each other. As we have noted already, a fundamental difference between Krugman's geographical economics and the various schools of contemporary economic geography is one of method. Krugman's reliance on formal models means that his work is rigorous and supported by mathematical proofs. In his view, the dependence of many of these models on unrealistic assumptions is not a grave problem nor a serious limitation. Instead, he appears to regard these models as rough metaphors or representations of the core of real world problems (Krugman 1995). When the models' results are found to be inadequate, their assumptions can be modified. In contrast, most contemporary economic geography has abandoned the use of formal modeling and is dominated instead by various types of political economy, which aim, above all, to be "realistic." From this perspective, Krugman's models have an inadequate sense of geographical and historical context. Knox and Agnew (1994), for example, argue that Krugman's core-periphery model in *Geography and Trade* differs from other location models in that it does not suggest a long-term process of conver-

gence. Instead, "the long term never arrives" (Knox and Agnew 1994, 83). There are multiple equilibria as concentrations persist for long periods of time but may then be unraveled by new patterns of concentration. However, Knox and Agnew insist that

concentration somewhere . . . is the perpetual rule. So though apparently attentive to historical change, this model is static in its assumptions about the operation of economic locational principles. The same principles of increasing returns, imperfect competition, and agglomeration are at work *in the same way* all the time. From this point of view, geographical outcomes can change but the process driving them does not. (1994, 83; original emphasis)

While this phrasing may be too strong,¹² Krugman (1991a) clearly states that the patterns of concentration that he describes are typical only of some industries under certain conditions; nevertheless, it does identify an important weakness in Krugman's work. He claims that the same broad locational forces which explain the growth of nineteenth-century concentrations also underlie the continued tendency to agglomeration. Indeed, this is one reason why he is reluctant to emphasize technological spillovers as a key determinant of contemporary clusters. At the same time, however, Krugman makes several passing references to the way in which the nature of agglomeration has changed over time. Thus he suggests, in one paper, that the railway and steamship were responsible for the emergence of core-periphery distinctions and that the age of this type of divergence may have passed. But such a "throw-away" suggestion requires a great deal more explanation. The historical ground-

ing of Krugman's approach remains unclear and clouded by ambiguity. What is clear is that his emphasis on continuity in the forces responsible for capital's agglomeration contrasts with economic geographers' focus on historical patterns of restructuring. However, the relative merits of this more historical approach depend on precisely how change is theorized and explained. It is impossible here to talk about economic geography as a whole; we have therefore selected two relevant areas of work, namely the recent literature in industrial geography on regional agglomeration and recent writing on theorizing the geography of trade.¹³

The Resurgence of Regional Economies

During the past decade, the most influential approach to industrial organization within economic geography has been the notion of a fundamental transition from Fordist mass production to more flexible production methods, such as flexible specialization. Scott and Storper (1992a, 1992b), Scott (1988), Storper and Walker (1989), and others have argued that internal economies of scale and scope have been undermined by increased market uncertainty and technological change. They argue that the response has been horizontal and vertical disintegration, or an externalization of production, which enables a greater ability to meet differentiated demand and a greater adaptability to market forces. Where a multiplicity of linkages are created which have geographically sensitive transaction costs, externalization is positively related to agglomeration. In this view, "Agglomeration is a strategy whereby producers ease the tasks of transactional interaction because proximity translates into lower

¹² After all, most of the main schools of economic geography and political economy may be criticized on similar grounds. All, for example, assume that the basic laws of economic development (as they perceive them) remain essentially unchanged as capitalism evolves over historical time.

¹³ These are two of the leading fields in contemporary (post-Marxist) economic geography. It would require another paper to consider Krugman's work in relation to the complete corpus of geographical work on uneven regional development.

costs and wider opportunities for matching needs and capabilities" (Scott and Storper 1992b, 13). In summary, the shift to flexible specialization has been responsible for the rise of new industrial districts and for the new, or renewed, significance of regional agglomeration (Sabel 1989). While there are many contrasts between this "new industrial geography" and Krugman's geographical economics (see Table 1), we shall focus on three issues: the treatment of industrial and market structure, of externalities, and of nonmarket transactions and relations.

As we have seen, Krugman tends to rely on several abstract models of monopolistic and oligopolistic market structure. The assumptions of these models are in some ways unrealistic, but the underlying rationale is that they are useful because of the pervasive presence of imperfect competition. In contrast, the flexible specialization approach has envisaged a new type of competition involving downsizing and

disintegration and therefore a movement back toward perfect competition. However, the idea that corporate disintegration is a necessary response to uncertainty can be criticized (see, for example, Lovering 1990; Phelps 1992). Moreover, as Phelps (1992) has argued, Scott's analysis of the causes of agglomeration pertains primarily to situations approximating to that of perfect competition. In Phelps's view, "The assumption of near-perfect competition is otherwise implicit in an analysis which applies to single plant firms and neglects considerations of differential economic power embodied in linkage structures" (1992, 41). This is especially problematic when the analysis is applied to international trade. As Markusen (1993, 287) writes, "Most important internationally traded industries are now multinucleated, with large national firms thrust into more spirited competition with similarly sized and politically well-endowed firms from other nations." Hence, "the number of players is relatively small, their sizes and clout are varied, and none of them is

Table 1
A Comparison of Krugman's "Geographical Economics" with the "New Industrial Geography"

	Krugman	New Industrial Geography
Externalities	Marshallian, especially labor pooling, specialist suppliers "Pecuniary" market-size effects	Marshallian trio Labor market Specialist suppliers Technological and knowledge spillovers
Agglomeration	Local clusters Interregional center-periphery pattern	Industrial districts Craft-based High-tech Financial centers
Competition	Imperfect: monopolistic and oligopolistic; economies of scale	Competitive flexible specialization; economies of scope
Transfer costs	Transport, including trade barriers	Transactions costs
Technological spillovers	Not typical, but important in some industries; local and international	Local and fundamental to innovative success in high-tech clusters
Labor market pooling	Strategy of insurance against risk (both employers and employees)	Form of local social embeddedness
Social and cultural characteristics of clusters	Difficult to formalize and assumed a priori; best left to sociologists	Key preconditions for successful localization

unaware of the behaviour of its neighbors. These are characteristics of oligopolized markets, not perfectly competitive ones."

Several arguments have been used to support the association of near-perfect competition with agglomeration. One is the finding that in some industries and places larger producers are located away from local clusters of industry (Hoare 1975; Scott 1986), and another is the observation that the decline of some industrial districts has been associated with the concentration of production into larger firms (Steed 1971). These are contingent findings, however. For example, Scott (1992a) notes that large producers are integral to the Southern Californian computer districts. Even where large firms are not found in local industrial clusters, they may be central to the regional and metropolitan concentrations modeled by Krugman. It cannot be assumed that internal economies of scale and scope act against agglomeration. Indeed, the intraindustry trade literature implies that, with increasing product diversity, internal economies and agglomeration become more closely linked. There is clearly a need to research the relations between market structure and locational dynamics in more detail.

This difference on the issue of competition has important consequences for understanding externalities. In order to compare Krugman's representation of externalities with that used in the "new industrial geography," it is helpful to set both approaches within a general framework. De Melo and Robinson (1990) argue that three main approaches to externalities are apparent in recent economic literature. The first is the Marshallian externalities approach, which we discussed above. They suggest that some parts of endogenous growth theory fall within this approach. For example, in an article on the externalities arising from human capital formation, Lucas (1988) talked about increasing returns at an economywide level. The second type of externality that De Melo and Robinson identify are those that result in uneven

rates of growth and occur with imperfect competition. Again, there are examples from endogenous growth theory: Romer (1990) sees investment in R&D in a situation of monopolistic competition as generating externalities in disembodied knowledge. The third type of externality arises from demand spillovers between sectors and industries. Murphy, Schleifer, and Vishny (1989), for example, argue that there are low-level equilibrium traps, where industrialization remains unprofitable. Industrial production only becomes profitable for individual firms in the context of more general demand linkages.

This framework provides a means of comparing the two approaches to agglomeration (Table 2). Krugman's focus on market-size effects is clearly closest to, and draws most heavily on, pecuniary externalities.¹⁴ As we have seen, his explanation of local clustering also invokes certain types of Marshallian external economy. Importantly, he has tended to downplay the significance of externalities based on spillovers in technological knowledge. Krugman (1987c) describes these as "elusive," preferring to concentrate on externalities that can be modeled. The difference between his approach and that of the "new industrial geography" is apparent. In accordance with the reliance on situations of near-perfect competition, Marshallian external economies have been at the forefront of the industrial districts literature. As Phelps has argued, and as Krugman's account demonstrates, the external economies that can be used in this approach are only a subset of the range available (Phelps 1992). To a certain extent this limitation has been weakened by those revisionist studies of industrial

¹⁴ Krugman (1993b, 1995) describes this type of external economy as similar to those envisaged in "Big Push" interpretations of industrialization. He argues that a large-scale program of industrialization can take advantage of external economies and complementarities and so reduce the risk of investment (see Rosenstein-Rodan 1943).

Table 2
Comparison of the Treatment of Externalities in Krugman's
"Geographical Economics" and the "New Industrial Geography"

Type of Externality	Application to Agglomeration	
	Krugman	New Industrial Geography
Marshallian external economies	Local clusters of industry associated with market-size effects (labor pooling and specialist suppliers) and with internal economies	Districts associated with vertical disintegration and transaction costs; technological spillovers important
Knowledge and technological spillovers under imperfect competition	Important in some industries, but not typical and difficult to model — "too fashionable"	(Not typical; where present large producers tend to adopt decentralized and flexible organizational forms)
Pecuniary externalities (demand and supply spillovers)	Regional specialization and concentration on a grand scale (center-periphery) through interaction of market size, demand, and transport costs	(Typically regarded as Marshallian; much more emphasis on nonmarket conditions)

districts which argue that large producers can imitate decentralization. However, the contradiction between a commitment to perfect competition and the dependence of Schumpeterian models of "creative destruction" and local technological spillovers on imperfect competition cannot be resolved easily.¹⁵

The differences between Krugman's geographical economics and the recent work in economic geography on regional development are not confined to industrial structure and externalities, but also extend to the question of nonmarket transactions. Thus another important contrast between Krugman's approach and

those of economic geographers is the manner in which the increasing power of larger producers has been related to contemporary localizations of industry. In economic geography there has been some dissatisfaction with the way in which the flexible specialization literature has ignored the increasing internationalization of firm structures and globalization more generally (Amin and Robins 1990; Gertler 1992). Consequently, there has been an interest in the way in which large firms interact with industrial districts. In contrast to Krugman's market-size effects, however, the main emphasis has been on the intermingling of firm and local networks (Amin and Thrift 1992; Grabher 1993). Networks have usually been defined as types of organizational relation that are neither market transactions nor hierarchies, and the term has been used to refer to cooperative and mutually beneficial relationships among producers (Cooke and Morgan 1993). Using this definition, the boundaries of firms become blurred, and firms and districts become intermingled. On the one hand,

¹⁵ Schumpeterian models of "creative destruction," technological spillovers, and endogenous growth depend on imperfect competition. Typically, the incentive for firms to develop new products and processes stems from the temporary monopoly profits which they can earn (Grossman and Helpman 1991; Aghion and Howitt 1993). This sits uneasily with the new industrial geography's emphasis on near-perfect competition.

Krugman's contrary emphasis on pecuniary relations is a reminder to geographers not to lose sight of market effects. But on the other hand, Krugman's neglect of externalities that are intangible and leave no paper trail appears too restrictive. As Jaffe, Trajtenberg, and Henderson (1993) have pointed out, knowledge flows do sometimes leave a paper trail, in the form of citation of patents.

The interest in network forms of organization in economic geography reflects a more general concern to examine the ways in which economic activities are "embedded" in, and made possible by, social and cultural conditions. This has been applied with particular force by Storper (1992a) to high-technology districts. As Harrison (1992) notes, this interest in embeddedness has been the distinctive contribution of the recent geographical literature on industrial districts.¹⁶ This stands in complete contrast to Krugman's rejection of invisible externalities. However, as Storper (1992b) argues, in the context of increasing market contestability, it is difficult to explain the continuing competitive advantage of certain districts if their conventions, rules of behavior, and implicit accords are not taken into account. Conversely, the decline of other regions appears to be partly a result of the "lock-in" of outmoded conventions and rules of behavior (Grabher 1993). Krugman's rejection of non-market linkages seems to be made primarily on the grounds that if externalities cannot be modeled then they have to be assumed *a priori*, so that the analyst can say anything she or he likes about types of spillover. But this rules out other methods of research and more sociological approaches. Moreover, Krugman's reluc-

tance to envisage nonmarket linkages seems to conflict with his commitment to new-Keynesian economics, where expectations and conventions are central. He himself shows (Krugman 1991c) that, under certain conditions, expectations may affect the course of regional development. But, if they are to be understood, expectations cannot be treated as exogenous "animal spirits." Rather, they are an integral part of social conventions and meanings, and their formation should be an important area for regional research. Our conclusion, then, is that there is a need for a greater exchange of ideas between Krugman's work and the geographical literature. But this applies not only to research on regional agglomeration but also to that on trade more generally.

The New Political Economy of Trade

Recent years have seen a growing interest by economic geographers in the spatial patterns of international trade. While this work has lacked a comprehensive theoretical framework, it has nevertheless been characterized by shared themes revolving around the inability of conventional geographies, based on Ricardian comparative advantage, to explain fully the complex character of contemporary international patterns. In accord with the "new trade theory," this geographical revival has stressed the importance of shifts in the world economy and the rise of intraindustry and intracorporate trade. One of the defining features of this revival has been a call to study the ways in which the geography of trade is shaped by states and by trade regimes. This emphasis on state policy, and the interpretation of trade on which it is based, contrasts with Krugman's approach in ways that raise fundamental questions about the effects of trade and its policy implications.

Some years ago, Johnston (1989) called for trade to be explained as part of a holistic theory of uneven development that combines the logics of capitalism and the policies of states. To some degree, his

¹⁶ Amin and Thrift (1994) describe this embedding as best summed up by the phrase "institutional thickness." This is defined by a strong institutional presence in a local area, high levels of interaction among these institutions, strong social structures, and a collective awareness of common enterprise.

plea for an enlarged research agenda has begun to be recognized. Grant summarizes recent developments as follows:

The unifying theme in newer approaches is their study of the interactions between governments and firms and their connections to trade and industrial policy within the context of a politically and economically competitive world economy, one in which governments attempt to "create" the most advantageous environment for national business. Accordingly, approaches recontextualize comparative advantage to include an understanding of developments in the trade-industrial policy arena. (1994, 301)

In line with this theme, Grant focuses on the role of governments, especially the formation of regional blocs, and the role of firms as the bases of a more comprehensive theory. Moreover, he argues that high-technology trade occupies a key place in any new theory, as success in high-technology bestows national benefits on productivity and high-wage job creation (see also Drache and Gertler 1991). Likewise, in their recent study of trade in textiles and clothing, Glasmeier, Thompson, and Kays (1993) contend that it is necessary to understand how the actions of the state influence the structure of global competition. Indeed, they conclude that state actions have superseded market forces as the regulator of the industry's geographical evolution.

The conceptual movement away from orthodox comparative advantage explanations has been most fully spelled out in *Trading Industries, Trading Regions*, edited by Noponen, Graham, and Markusen (1993). Here again it is argued that success in trade is fundamentally shaped by government intervention. In a chapter in that volume, Howes and Markusen claim that governments have played a key role in creating and maintaining industrial leadership, and that "in a world with governments successfully conducting such industrial and trade policies, open economies without such efforts will find themselves the targets of import penetration and potential export market shrinkage" (Howes and Markusen 1993, 4). In this

view, factor endowments can be used to explain trade in minerals, agricultural goods, and some labor-intensive consumer goods; but the majority of trade between developed market economies can only be explained by a "dynamic revisionist" theory. This has four major tenets that contradict orthodox trade theory. First, the mix of sectors matters, as some industries have greater growth and productivity differentials. Second, growth is not constrained by factors but by demand for the product. Third, in some industries rapid growth leads to continuing success due to increasing returns. Fourth, because of the existence of increasing returns, comparative advantage may conceivably be created by strategic intervention on the part of nation-states and regional authorities. On this basis they argue that the orthodox view that free trade means growth for all regions is mistaken; instead, "there is some danger that the unfettered pursuit of free trade will actually depress wages and employment and lower world living standards" (Howes and Markusen 1993, 35). Furthermore, Markusen (1993) argues that in the United States free trade and laissez-faire strategies have produced persistent unemployment and a waste of infrastructure.

While this "dynamic revisionist" theory shares an emphasis on "new trade theory" with Krugman, it more closely resembles the strategic trade views of authors such as Tyson (1992) and Reich (1991), whom Krugman (1994a, 1994c) has recently criticized.¹⁷ As we have noted, Krugman remains convinced that the mutual benefits of greater international trade outweigh the costs. Moreover, in his opinion, comparative advantage is not just a sector-specific theory, it remains a general principle that explains the beneficial

¹⁷ For a debate on Krugman's critique see the discussion on "The Fight over Competitiveness" in *Foreign Affairs* (1994a), Friedman (1994), and *The Economist* ("The Economics of Meaning" 1994).

consequences of trade. The concept makes clear that absolute productivity advantage in some areas is not necessary for a country to gain from economic integration. Trade, therefore, is not a zero-sum game, so that concerns about national competitiveness are misplaced and unfounded. Krugman (1987b) concedes that the intellectual case for free trade has been weakened and that it is not an absolute ideal, but he believes that it is still the best general policy or rule of thumb. But Krugman's position faces several key questions. The first is the extent to which this continuing use of comparative advantage is compatible with his own emphasis on the pervasive presence of increasing returns. Kaldor (1985), for example, argues that the presence of increasing and diminishing returns conflicts with the basic tenets of Ricardian comparative advantage. Simply put, he contends that diminishing returns may mean that the resources released by trade will not necessarily be employed in other sectors, so that there is a real possibility of absolute loss (a "negative sum" game). Conversely, increasing returns in some industries may inhibit the transfer of resources elsewhere. Krugman's economic geography pays insufficient attention to these problems. This is reflected by his insistence that it is pointless to try to identify high-return sectors, so that the mix of sectors does not really matter.¹⁸ Given his insistence on the importance of productivity, it is surprising that he devotes little attention to the extent to which high-technology sectors do generate the productivity spill-

overs which some authors have suggested (for example, Hanink 1994).

The second question is whether Krugman underestimates the significance of adjustment costs and the obstacles to regional adjustment. On the one hand, Krugman is committed to a nonequilibrium view of economic geography in which there is no process of convergence to a spatial equilibrium where all factors are equally rewarded. He rejects the neoclassical faith in the efficiency of markets on the grounds that the collective result of individual choices may be to "lock-in" a bad result. On the other hand, in a methodological sense, Krugman (1993a) insists that all economic models should contain a well-specified equilibrium. By this he means that they should specify how individuals behave and show how market outcomes emerge from the interaction of these individual behaviors (Krugman 1993a, 115–16). He holds these two opposing convictions together, it seems, through a commitment to a "new Keynesian" brand of economics. According to this, economic trends and patterns are the products of innumerable individual decisions, but these decisions are not perfectly rational and informed. Instead they are frequently both near-rational and individually reasonable and sensible. However, in imperfectly competitive markets the aggregate result will be unstable and irrational. In his words, "What look like highly irrational outcomes in the marketplace are caused by the interaction between imperfectly competitive markets and slightly less than perfectly rational individuals" (Krugman 1994c, 213). But if emphasis is placed on the second of these factors, then the position is readily reasimilated into a neoclassical view of the economy. It lends itself to the view that markets would adapt efficiently and rapidly if only people would behave rationally. This is exemplified, perhaps, by Krugman's (1993e) argument that Euro-sclerosis, or the problem of a persistently high level of unemployment in Europe, has been caused by the effects of welfare states on labor markets. The whole

¹⁸ Krugman's (1994c) argument is that it is wrong to assume that high-technology sectors such as computers and aerospace are the sectors with highest value added per worker. In fact, he notes that in the United States the real high-value industries are extremely capital-intensive sectors, such as cigarettes and oil refining. This says nothing, however, about the possibility of positive spillovers from the high-technology sectors.

question of adjustment to the effects of trade is one that Krugman has recently considered explicitly in terms of the impact of economic integration on regional development, particularly in the European Union, and it is to this aspect of his work that we now turn.

Krugman's Model of Economic Integration and Regional Development: The Lessons of the United States for Europe?

The regional consequences of European economic integration is an issue that has attracted surprisingly little attention from economic geographers. At the heart of this issue is the question of what the impact of progressive economic and monetary integration in the European Union (EU) will be on regional patterns of economic growth, employment, and income across member states. Economists have offered two opposing answers to this question. On the one hand, there are those who believe that the free movement of goods, services, and capital associated with European economic and monetary integration (EMU) should lead to regional convergence, not only in factor returns and economic performance but also in economic structure. To the extent that wages and other costs are lower in the less productive and slower-growing regions, the removal of barriers to trade and factor movements, it is argued, should enable industries and services in these regions to better exercise this comparative advantage and to attract increased flows of capital investment.¹⁹ This optimistic scenario is, on balance, the view taken by the

European Commission (Commission of the European Communities 1991, 1994). In contrast, others argue that economic integration will intensify rather than reduce regional imbalances in growth and income across the European Union. Instead of leading to equalizing centrifugal movements of firms and investment toward depressed and peripheral regions within the European Union, economic integration is likely to stimulate a spatial reconfiguration of economic activity in favor of growth regions precisely because these are the areas that already enjoy greater comparative advantage in terms of access to markets, inputs, expertise, and business infrastructure.²⁰

Krugman falls into the second of these two camps, although he appears to subscribe to two somewhat different models of regional divergence. In an earlier paper (Krugman and Venables 1990), he follows a core-periphery argument not unlike that in *Geography and Trade*. Although the removal of barriers to trade and movement of capital and labor within the European Union will increase the inflow of capital into, and the relative competitiveness of, the low-wage peripheral regions, given transport costs this centrifugal process is on balance likely to be outweighed by further concentration of industry and employment in the high-wage core regions, because these areas have the largest markets, well-developed external economies and infrastructures, and a comparative advantage in terms of

¹⁹ Additionally, economic integration represents a major supply shock to such regions, since it exposes them to the full force of competition elsewhere in the system. Such shocks, the argument continues, should (allowing for adjustment lags) eliminate inefficient firms, work practices, and products in depressed regions and improve their supply-side competitiveness and flexibility.

²⁰ Because the gains foreseen from completion of the internal market are thought to be generated mainly endogenously, the various processes of resource allocation are bound to cumulate resources in the leading core regions. It is the historically established competitive advantage of the growth regions which enables them to capture a disproportionate share of the benefits of economic integration. As for the depressed and lagging regions, economic integration is seen as bringing prolonged problems of adjustment and the need for greater levels of spending on regional policies.

relative accessibility. His second approach is more emphatic, but different in its specific arguments. In his paper on the "Lessons of Massachusetts for EMU," he supports the movement toward European economic integration as "a generally good thing," but argues that it will lead to greater regional instability and divergence of regional growth rates (Krugman 1993d, 241). In developing this thesis he begins by drawing on his earlier ideas on trade and the localization of industries that we have discussed above:

For regional issues . . . in the EC, . . . the key aspect of regional specialisation is the dependence of regional economies on export clusters held together by Marshallian external economies. . . . Are such regional clusters more likely to form in a more integrated economy? The answer is definitely yes. (Krugman 1993d, 244)

These ideas are then used in a somewhat different way from his earlier work to produce a theoretical account that not only carries over some of the problems we have already highlighted, but also introduces additional elements of contention.

The gist of this second model may be summarized as follows. First, given the existence of increasing returns, the expansion of interregional trade that EMU will bring about will lead to greater regional industrial concentration and specialization along essentially arbitrary lines. Once under way, there will be a tendency for this regional specialization process to become "locked in" by the operation of location-specific external economies. Second, Krugman argues that this increased regional specialization will render the European regions much more subject to random, idiosyncratic demand and technology shocks, so that region-specific recessions and crises will be more likely to occur.²¹ Third, when combined with

the increased factor mobility that integration will promote, such region-specific shocks will lead to divergent long-term regional growth paths. Thus, fourth, given that under EMU member states will no longer be able to use the exchange rate mechanism as a policy instrument (see also Krugman 1989), the only way regional adjustment problems can be ameliorated is by transferring a significant part of national budgets to the European Union to allow fiscal federalism to function as an automatic stabilizer.

Thus, in contrast to his previous work—for example, in *Geography and Trade* (1991a) and Krugman and Venables (1990)—Krugman argues that the process of uneven regional development that EMU may be expected to produce will not be one of cumulative divergence into a core-periphery pattern. He believes that the forces generating this form of uneven regional development have probably reached their limit in advanced industrial nations; indeed, he suggests that in both the United States and Europe industrial activity is becoming much more evenly distributed geographically (Krugman 1993d). Rather, in his view the process will be one of increasing regional export specialization, with the result that the pattern of regional growth and decline will be more unpredictable, dependent on the particular incidence of random demand shocks. Hence, unlike the argument in *Geography and Trade*, past regional success need not be self-reinforcing, and even prosperous regions may experience sudden reversals of fortune.

Another distinctive feature of Krugman's exposition is the method he uses to support his theory empirically. The United States is taken to be the sort of integrated economic and monetary unit which the European Union is seeking to emulate, so that regional experiences in the former are considered to be a good guide as to what to expect in the latter.

²¹ In an earlier paper, Krugman (1989) stressed that increasing interdependence in Europe acts as a buffer against regional and national shocks, but this buffering effect only

acts against locally generated recessions such as those caused by investment slumps.

Using simple measures of the dispersion of economic structure, Krugman (1991a, 1993d) finds that the broad regions of the United States are more industrially specialized than are European countries. Furthermore, a comparison of Belgium with the state of Ohio is used to suggest that the regional employment growth rates in the United States are more unstable than in the European Union. He then examines the disparities in long-term growth rates between certain states in the United States and among the main EU countries and finds that these disparities are larger in the United States than in Europe. In addition, he uses the recent economic slump in the New England region of the United States as an illustration of how, in a monetary union, regional industrial specialization can give rise to pronounced local instability in the face of region-specific demand shocks, and how such shocks can lead to permanently lower levels of employment (Krugman 1993d). These various empirical results are taken as lending support to his thesis that increased market integration in the European Union will lead to more regional specialization and unequal growth. In our view, however, Krugman's empirical examples and findings are not of themselves sufficient to prove his case, and several features of his analysis are problematic.

Economic Integration and Regional Specialization

The first problem concerns the evidence on regional specialization. What is the "regional" scale being referred to? The "regions" used by Krugman in his comparisons of regional specialization and regional growth rate disparities in the United States and the European Union are extremely aggregate ones: the four "Great Regions" and individual states in the former and whole countries in the latter. Krugman argues that these spatial units are of roughly similar size, and thus broadly comparable. That may be so, but they do not necessarily represent the

geographical scale at which local external economies and the processes leading to industrial clustering actually operate. The basic point is that the analysis of localization economies requires an identification of the relevant regions as economic areas and the relevant level of industrial disaggregation at which to measure the extent of geographical concentration and specialization. The geographical literature on "new" flexible industrial districts indicates that such clusters are in fact quite localized, and far smaller than the broad spatial units used by Krugman. Certainly in the European Union, local differences in economic structure and economic growth rates *within* member countries (for example, at the so-called NUTS1 and NUTS2 level regions) are much larger than the disparities *between* countries (Collier 1994; Dunford 1993; Dunford and Kafkalas 1992). Likewise, as von Hagen and Hammond (1994) argue, the metropolitan rather than the state or broad regional level is the most meaningful one for analyzing geographical differences in industrial concentration and localization economies in the United States, a view to which, as we have already noted, Krugman has elsewhere subscribed. These findings imply that Krugman's method of comparing the European Union with the United States will generate different results according to the geographical scale used to define economic regions in the two areas. Indeed, it may even be that at some geographical scales regional specialization is not in fact greater in the more-integrated economy of the United States than in the European Union.

In any case, is increasing regional industrial specialization an inevitable outcome of economic integration? While the existence of external economies and localization economies in the European Union could well lead to the increased regional specialization that Krugman predicts (Baldwin and Lyons 1990; Cabellero and Lyons 1990, 1991; Martin and Rogers 1994a, 1994b), some observers have argued that product market integration in the European Union will increase the

scope of *intraindustry* trade there still further, and that this is likely to render regional industrial structures increasingly *similar* over time (Commission of the European Communities 1991; Eichengreen 1993; Emerson, Anjean, and Catinat 1988). Indeed, possible evidence for this effect is provided for the United States by Krugman: as he shows, U.S. statistics indicate that regional specialization there has actually been declining since the Second World War (Krugman 1991a, Chap. 3). He suggests that this may be a statistical illusion, in that specialization may have become more difficult to measure but may not necessarily be less in fact. However, there is also evidence from Europe that economic integration and increased trade lead to regional industrial *diversification* rather than specialization (Peschel 1982). Indeed, both the definition of regional economic "specialization" and the question of how specialization actually influences regional instability are not straightforward issues.²² As a number of writers have shown, the empirical patterns of regional shocks in both the United States and the European Union appear to be more complex than those posited by Krugman (see, for

example, Bayoumi and Eichengreen 1993; Palmini and Cray 1992; von Hagen and Hammond 1994). There seems to be no simple relationship between economic integration, regional specialization, and regional shocks. Both the pattern and severity of shocks will depend not only on the degree and geography of regional industrial specialization, but also on how such shocks are transmitted between regions (for example, through interregional input-output linkages and the impact of government policies) and on how flexible regional labor markets are in adjusting to disturbances. In short, much more theoretical and empirical analysis of regional industrial specialization within both the United States and the European Union is required before the former can be taken as a guide of what to expect in the latter.

Economic Integration and Divergent Regional Growth

This last point links with the third element of Krugman's thesis, that demand shocks in an integrated Europe will have permanent regional growth effects, in the same way that temporary policies may have long-term implications (Krugman 1987a). Suppose a region experiences a decline in the demand for its clusters of export industries. This would put downward pressure on relative wages and other factor costs in the region. If relative wages and other costs fall, this would help to restore the region's competitiveness vis-à-vis other, higher-cost regions, so that new industries would be attracted there and demand and growth should be restored. As Krugman puts it,

Regions that have been unlucky in their heritage of industries from the past will have lower costs than lucky regions, and will therefore be more likely to break into industries in the future. We would expect this process to put limits on the extent of regional divergence in growth. (Krugman 1993d, 248)

Unfortunately, however, according to

²² There is a sizable literature on this topic, although it is not referred to by Krugman (for example, see Barth, Kraft, and Wiest 1975; Conroy 1975; Brewer 1984; Jackson 1984; Kurre and Weller 1989). Much of this is based on what is called a "portfolio" approach to the analysis of regional industrial specialization. This type of analysis, first applied to regional economics by Conroy (1975), borrows the concepts of expected return and risk from theories of the optimal diversification of financial portfolios developed by Markowitz (1959). The regional industrial structure may be conceptualized as a "portfolio" which provides "returns" to the region in the form of employment, income, and tax revenues. These returns are associated with risk—arising from demand and technology shocks—as represented by the variance and covariance in the returns. It is this measure of risk, "the portfolio variance," which measures the degree of instability of the region.

Krugman labor mobility prevents the wage flexibility mechanism from bringing regional growth rates into balance in this self-correcting way. To the contrary:

An unfortunate region will not have lower factor prices for very long: capital and labour will move to other regions until payments are equalized. This means, however, that there is no particular reason to expect a region whose traditional industries are faring badly to attract new industries. It can simply shed people instead. The implication is that relative output and employment of regions should look more like a random walk than like a process that returns to some norm. (Krugman 1993d, 248)

In developing this argument, Krugman draws on Blanchard and Katz's (1992) study of patterns of growth among U.S. states. According to these authors, while employment growth rates differ consistently across U.S. states, unemployment rates and wages vary much less, suggesting that when states are hit by demand shocks workers react by relocating (see also Barro and Sala-i-Martin 1992). There is no discernible tendency for states to recover lost jobs: relative regional unemployment returns to normal through the out-migration of workers. This would seem to be in contrast to the adjustment process in the European Union, where historically factor mobility has tended to be far lower than in the United States and regional unemployment disparities appear to be characterized by greater hysteresis (Eichengreen 1993). Krugman draws the obvious implication that if Europe moves toward U.S. levels of regional specialization *and* factor mobility, disparities in economic growth rates among countries and regions may be expected to increase.

Labor mobility is thus central to Krugman's model of divergent regional growth. In this respect his analysis is similar to local "endogenous growth" models, in which labor mobility intensifies local disparities in the accumulation of human capital and hence long-term development (Grossman and Helpman 1991; Bertola 1993). In this respect we find it somewhat

curious that Krugman is at pains to distinguish his model of uneven regional development in the European Union not only from "core-periphery" models of cumulative concentration but also from "local endogenous growth" models (Krugman 1993d). His own model implies a similar cumulative divergent growth mechanism, at least in the sense that interregional shifts in labor prevent the reequilibration of regional growth rates. The question mark over his analysis is exactly how far labor mobility will increase in an integrated Europe. Although interregional migration across national borders will in principle be unrestricted, there are further reasons to doubt whether labor mobility will ever reach the levels found in the United States. The marked cultural and language differences across Europe will continue to be a significant barrier to migration for many groups of workers. But if this form of adjustment to regional shocks remains slow, where does this leave Krugman's view of regional long-term growth differences in an integrated European Union?

The implication of his model is that if labor mobility is low, then local (downward) relative wage flexibility will serve to restrain the degree of divergence between regional growth rates. Unfortunately, wages in the European Union do not seem to be particularly flexible: European labor markets appear to be more rigid or "sclerotic" than their American counterparts, a point highlighted by Krugman (1993e). In the European regions, adverse sectoral demand shocks trigger greater unemployment, without the equilibrating mechanisms of labor migration or downward relative wage movements (the rigidity of the latter possibly reflects the considerably higher rates of institutionalized wage setting among workers and the availability of more generous unemployment benefits in the EU countries compared to the United States). The Commission of the European Communities (1990) argues that EMU, by increasing the credibility of fiscal authorities' commitment not to bail

out depressed regions, should encourage workers in such areas to moderate their wage claims, thus imparting greater local wage flexibility. In practice, little is known about how far regional relative wages would have to fall in order to stimulate capital inflows and the restoration of employment. Equally, we still know little about interregional productivity and technology spillovers, which may offset the need for wage reductions (Jaffe, Trajtenberg, and Henderson 1993; Audretsch and Feldman 1994). In short, it is by no means obvious whether increasing integration in the European Union will lead to convergence or divergence of regional growth. The evidence so far would seem to suggest that "club convergence" may be the most likely outcome, with convergence within the northern, core regions, on the one hand, and within the southern and peripheral regions, on the other, but little or no convergence between these subsets (Button and Pentecost 1993; Chatterji 1993; Neven and Gouyette 1994).

Thus, though suggestive, Krugman's arguments about the impact of economic integration on regional trade, specialization, instability, and long-term growth disparities in the European Union are problematic and limited. Comparison between the United States and the European Union in terms of "regions" and their structures, shocks and reactions to them is not, perhaps, as valid as Krugman and others (such as Eichengreen) assume. We do not have a counterfactual history for the United States—that is, a picture of what regional development would be like if the United States was not an economic and monetary union. Nor do we know what would have happened to the regions of the European countries in the absence of the formation of the European Community and its recent movement toward EMU. Finally, what of Krugman's views on the regional policy implications of European integration? To assess this aspect of his analysis we need to look at the policy debate within the new trade theory more generally.

Trade and the Regional Policy Issue

Strategic Trade Policy

Like much of his other work, Krugman's views on the role of trade and industrial policy have shifted over time. In his early writings he reacted against the idea of targeted industrial policies, on the grounds that they were based on crude misconceptions and that even if more-sophisticated theorizations could be found such policies were still unlikely to be effective in practice (Krugman 1983, 1983b, 1984). Not long after, however, he had constructed a sophisticated theoretical argument for "strategic trade policy" (Krugman 1986). One of the most contentious aspects of the new trade theory has been the debate it has generated over the question of strategic industrial policy. Whereas conventional trade theory denies there is any case for "activist" trade or industrial policies, the new trade theory directly challenges the conventional view. According to Krugman (1986) and other new trade theorists (for example, Brander and Spencer 1983, 1985), an "activist" trade policy can benefit a country relative to free trade in two ways. The first is through "rent creation." If a government can promote a new or expanded monopoly position for domestic factors of production in industries that trade internationally, then a targeted industrial policy can in principle raise a country's income at foreign expense. Second, targeting can raise income if there are certain industries in which the resources committed by individual firms indirectly raise the earnings of other firms' resources—that is, where external economies can be generated. In both instances, the argument is that it may well be possible to identify some "strategic sectors" that at the margin are more valuable than others, and that the promotion of these sectors through protection, export subsidies, support of R&D, and so on could raise national income.

More recently, however, Krugman has reacted against strategic trade policy. In

Peddling Prosperity (1994c), he questions the theoretical validity of strategic industrial policy and goes on to berate leading American politicians (especially President Clinton) and their economic advisors (especially Thurow and Reich) for misappropriating strategic trade theory and applying it in a "simple-minded way." Both Reich (1991) and Thurow (1994) are criticized for peddling the view that if the United States is to compete in the global economy, the government should abandon its notions of free trade and minimalist industrial intervention and instead pursue a more activist stance aimed at promoting the shift of American industry into "high value" (Reich) and "sunrise" (Thurow) sectors. Krugman believes that such views are based on fallacious theory, impractical politics, and an erroneous obsession with the idea of "competitiveness": "While competitive problems could arise in principle, as a practical, empirical matter the major nations of the world are not to any significant degree in economic competition with each other" (Krugman 1994a, 35). In his view, competitiveness relies on the metaphor of a country being a big corporation, when, in fact, countries (and regions) are nothing like corporations. Hence it is very difficult to establish a meaningful definition of national or regional competitiveness. Furthermore, he argues that it is wrong to see international trade as competition—as a sort of zero-sum game—when it is a process of exchange involving mutual benefit. By the early 1990s, then, Krugman had come to denounce strategic trade policy as "bad economics." Yet, while Krugman has vigorously attacked the whole ensemble of policies that have come to be labeled as "strategic trade policy," it appears that he now sees a role for a limited and focused industrial policy.

Geographical Clustering and Strategic Industrial Policy

In a recent paper Krugman (1993b, 160) states that he has "now changed his mind and . . . gone, at least slightly, soft on

industrial policy." His initial skepticism of the theoretical credentials and practical applicability of the external economies rationale for targeted industrial policies was on the grounds that only technological, not pecuniary external economies are of concern, that technological externalities in any case are of limited significance, and that they are international rather than national in scope (Krugman 1983b, 1984). But, as we have seen, he now believes that external economies associated with market-size effects are substantial and demonstrable (and often indistinguishable from technological external economies), and this means that targeted industrial policies have a potential role after all (Krugman 1987a, 1993b). Moreover,

many of the important market-size effects apply not at the level of the international or even the national economy, but at a regional or local level. The argument that the gains from support of industries that generate external economies will be dissipated abroad is therefore mostly wrong. (Krugman 1993b, 167)

In this revised view of industrial policy, not only are regional and local industrial clusters considered to provide empirical proof of the importance of external economies, such clusters help to *define* what industries should be supported. Geographical clustering provides the justification for industrial intervention, and the aim of that intervention should be to foster local externalities. In effect, what Krugman seems to be suggesting, though he does not use the term explicitly, is that the only justifiable form of industrial (trade) policy is in fact regional industrial development policy. In line with strategic trade theory, the underlying premise is that national industrial comparative advantage can be created through supportive and targeted industrial policies which aim to create and facilitate key sectoral specializations. The twist in Krugman's argument, however, is that the most effective scale at which to create that advantage is at the level of *regional clusters*. Essentially the same argument is

implicit in Porter's (1990) major work on national competitive advantage. Indeed, he now sees local and economic development policies as having an instrumental role in fostering national industrial competitiveness (Porter 1994).

It is only a small step from this to argue that the promotion of specialized export clusters is also the most viable approach to reviving and regenerating old industrial regions. This is, in fact, what certain writers on flexible specialization and industrial districts have implied. These authors use the success of certain well-known specialized (usually export-oriented) industrial districts as a model for "indigenous" local economic regeneration more generally (see, for example, Hirst and Zeitlin 1989; Pyke, Becattini, and Sengenberger 1989; Sabel 1989; Stohr 1989; Cooke 1990; Scott 1992b). The path to the reindustrialization of economically and structurally depressed regions is seen to be via the promotion and support of neo-Marshallian small-firm, flexibly specialized production complexes involving dense local networks of cooperation, competition, and horizontal interdependencies. In some ways this support for a local industrial strategy based on multiple externalities is similar to Krugman's rationale for industrial policy. However, the advocacy of regional export specialization either as a local economic development strategy or as a form of trade policy is contentious.

The key question over the promotion of regional industrial specialization is whether the potential advantages are outweighed by the likelihood of greater regional instability and shocks, and the risk of structural depression. As Krugman (1993d) notes for the case of Massachusetts, regional industrial specialization is a double-edged sword: it can be the basis of a high rate of export-led local economic growth in one period, but the source of prolonged local economic depression if that demand subsequently collapses or is captured by other competing regions (often in other countries). This is precisely what happened to many of the specialized

industrial districts celebrated by Alfred Marshall early this century (for example, see Sunley 1992). An equally persuasive case can be made that industrial *diversification* rather than specialization is the most appropriate regional development policy route, that diversifying the regional industrial "portfolio" reduces the susceptibility of the regional economy to adverse demand shocks and localized structural crisis (this is the general conclusion of the portfolio studies referred to earlier; see also Geroski 1989).

Krugman, on the other hand, appears to believe that the most important policy response to the possibility of regional instability in more-specialized regions is fiscal stabilization. In the case of European economic integration, for example, Krugman suggests that national budgets will have to be substantially centralized so that automatic federal European fiscal transfers can perform the required stabilization role when asymmetric regional shocks occur.²³ He notes the way in which the U.S. federal budget tends automatically to redistribute resources toward regions affected by negative economic shocks (via compensating adjustments in the tax-take and in welfare payments across regions):

While the US does not cope with the problems perfectly (as the current travails not only of New England but of the North East, in general, and increasingly of California, demonstrate), a highly federalized fiscal system helps a good deal. The lack of such a system in Europe therefore is a real problem. (Krugman 1993d, 258)

²³ In the European case, although fiscal federalism is indeed a natural corollary to EMU, national governments in a future European monetary union would not lose all of their instruments of economic policy. National budgetary policies would continue to have some, even if constrained, automatic stabilizing role (see Boonstra (1991) on the limits that EMU will impose on national budgetary autonomy). In this sense member states in a European EMU would be somewhat different from the individual states in the United States.

Krugman is at pains to distinguish this form of regional policy response from that needed to ameliorate "core-periphery" patterns of uneven regional development or the regional decline that stems from specialization in outmoded industries and products. The policy response to these sorts of regional issues, he says, "is much less related to EMU than the stabilization problem" (Krugman 1993d, 259).

However, while automatic fiscal transfers may well help to alleviate and stabilize the income and growth problems associated with economically depressed regions, they are not an adequate response to uneven regional development. By themselves, they are not sufficient to recast the structure and dynamics of regional development so as to improve the long-term economic performance and wealth of the regions concerned. This is why, of course, historically many European countries have developed elaborate systems of *region-specific* developmental aid and assistance, and why the European Union has been strengthening and reforming its own centrally administered regional structural funds in the context of the movement toward increasing economic integration (and enlargement) of the Union (see, for example, Martin 1993; Collier 1994). Krugman's distinction between regional instabilities due to idiosyncratic demand shocks and regional problems of a more "core-periphery" and "structural" nature is surprising and questionable. For if, as he argues, short-term regional shocks have long-term effects on regional growth, then interregional fiscal stabilization is an inadequate policy response, and other, more strategic forms of regional policy are required.

In our view, the proposal of fiscal federalism does not temper the worry that regional clusters of specialized industry will be unstable and fragile. The basic tension in Krugman's argument remains—namely, how to reconcile his suggestion that the aim of industrial policy should be to promote industrially specialized regional clusters with his thesis that increased regional industrial concentra-

tion and specialization leads to regional economic instability and divergent long-term growth paths. The response of the new industrial geography to this dilemma, of course, is to insist that flexibly specialized industrial districts are more adaptable to economic and technological change by virtue of the dynamism and networking of the small enterprises of which they are (invariably assumed to be) composed. However, this claim remains far from proven. In addition, the number of flexibly specialized districts remains small, and their origins and dynamics are matters of debate (see Markusen 1993; Markusen and Park 1993). This is not to dismiss the new "indigenous" approach to regional policy based on arguments of (flexibly) specialized industrial development; but it is to signal that this approach is no more of a general panacea for uneven regional development than was the old model of redistributive regional policy. Nor do we wish to imply that increasing returns and external economies are unimportant in the regional policy debate. To the contrary, not only is there evidence from Europe that increasing returns industries are more concentrated in regions with better infrastructures, especially technological and educational infrastructures (Martin and Rogers 1994a, 1994b), endogenous growth theory also suggests that external economies and technological spillovers are likely to play a key role in the local growth process in an integrated Europe. But in our judgment, there is an urgent need for much more thought on how local and regional policies can foster and support these externalities without simultaneously narrowing the industrial base and increasing the vulnerability of regions to demand shocks.

Conclusions

A few years ago, Neil Smith (1989) argued for a rebuilding of regional theory within geography based on a synthesis of ideas from location theory and uneven development theory. More recently, Krugman (1993a) has argued for a similar

synthesis of location theory and trade theory, for using economic geography as a key component in the construction of a new "geographical economics" of trade. In this paper we have sought to provide a critical assessment of Krugman's ideas on economic geography and his attempts to use these ideas to forge a "geographical economics." Because of the enormous volume and breadth of his writings we have had to skate across many of his ideas, and as a result we have no doubt failed to accord some of them the full attention they deserve. In addition, Krugman's tendency to constantly revise and even reject his earlier ideas renders the task of assessment akin to tracking a moving target. Nevertheless, we believe we have succeeded in isolating the core components of his arguments sufficiently to be able to identify some of their main strengths and weaknesses, particularly as they relate to the question of regional growth and development. In many ways, Krugman's approach to economic geography is a regional science one, a reworking of traditional location theory concepts and models. The new economic and industrial geography, of course, has moved well away from that tradition. For this reason, it might well be questioned whether Krugman's work contains anything that is new or useful for economic geographers. It would be wrong to be so readily dismissive, however; Krugman's work is not as simplistic as Johnston and others have suggested (nor for that matter is geographical work always as sophisticated as its practitioners appear to believe). For it is perhaps less the specific results of Krugman's analyses that are important for economic geography than the general stimulus they provide for further inquiry. In this respect we concur with the view that Krugman's work "is rich in ideas, seductive in taking us through simple logical arguments to surprising conclusions and so self-confident in the discussion of its assumptions and its premises that reading it is at the same time great fun and a continuous challenge" (Casella 1993, 261–62). The challenge, as we see it,

is to pursue a closer exchange between Krugman's "geographical economics" and the new industrial and economic geography. Neither can claim to have a monopoly of insight, but an exchange of ideas between the two would, we believe, be beneficial.

One strength of Krugman's work, without doubt, is that his linking of external economies and regional industrial agglomeration with trade provides an important corrective to the flexible specialization thesis of the new industrial geography, in which regional industrial development is viewed overwhelmingly as an indigenous process and the role of trade is typically either subordinated or neglected altogether. Furthermore, Krugman's emphasis on imperfect competition and pecuniary externalities likewise exposes the limitations of the conceptions of externalities now prevalent within the geographical literature. The thrust of flexible specialization ideas in economic geography is that agglomeration is associated with the shift from vertical integration to the horizontal integration of related activities among small, competitive firms which cluster together to minimize transaction costs. Williamsonian transaction costs economics—itsself a neoclassical-oriented form of institutional economics—has been used to give a new theoretical underpinning to Marshall's notion of industrial localization. Krugman's focus on pecuniary externalities, especially market-size effects, and the role that large, oligopolistic producers can play in industrial agglomeration suggests that industrial geographers need to reassess their theoretical accounts accordingly. Yet, at the same time, one of the most important limitations of Krugman's geographical economics is his stubborn concentration only on those externalities that can be mathematically modeled, and thus his reluctance to discuss the geographical impacts of technological and knowledge spillovers. Although the recent geographical literature has begun to assign key importance to technical change and technological externalities in shaping and

transforming the space economy, and hence to some extent holds some important lessons for Krugman's analysis in this respect, it too has yet to explore fully the cumulative and spillover effects associated with technological change.

A second significant aspect of Krugman's geographical is the recognition that regional economic development is a historical, path-dependent process. His repeated exhortation that "history matters," both in terms of the arbitrary initial conditions and accidental events that set in motion particular patterns of industrial development over time and space and in terms of the subsequent "locking in" of those patterns via self-reinforcing effects, is not of course particularly novel to economic geographers. Geographers have long recognized that a given pattern of uneven regional development, once established, tends to exhibit a high degree of persistence or "inertia" over time, and that this inertia can operate either to foster regional growth or to retard it. The more recent interest by geographers in the local socio-institutional "embeddedness" of economic activity also bears upon the issues of path dependence and lock-in. In Krugman's view the role played by geography in determining "lock-in" is strictly an increasing returns phenomenon, in the form of the Marshallian externalities associated with local industrial agglomeration (or, under certain circumstances, in the form of self-fulfilling expectations). What he fails to consider is the influence exerted by local institutional, social, and cultural structures in facilitating or constraining local economic development. This neglect would seem to stem in large part from Krugman's complaint that noneconomic or "social" factors are not easily modeled and that they should therefore be left to sociologists. But as recent studies in the new industrial and economic geography have begun to show, the "thickness" and nature of such socio-institutional "externalities" are fundamental to the initial emergence, trajectory, and adaptability of industrial districts and regional economies. Thus

Krugman is right to stress the role of geography in the historical, path-dependent nature of the economic process, but he fails to explicate the nature of that role.

A third aspect of Krugman's geographical economics that we want to highlight, and which also has both strengths and weaknesses, is his analysis of the way that region-specific shocks can have long-term growth consequences. How regions respond and adjust to demand and supply shocks, both in the short term and in the long run, in an increasingly deregulated, market-propelled, and uncertain world is an important research issue, but one that has been neglected by the new industrial geography. Krugman's analysis for the EU regions, using the U.S. regions for comparison, provides a useful basis for developing this research agenda. However, as we have seen, his analysis is far from unproblematic. Apart from being too American-centered (as exemplified by his emphasis on the central role of labor mobility, which is considerably higher in the United States than in Europe), his models do not adequately explain why a successful regional economy (like Massachusetts, for example) can suddenly go into reverse, or why the geography of uneven regional development can and does undergo significant reconfigurations ("spatial switching"), or why some regions seem better able than others to withstand or adjust to negative external shocks. Krugman singles out industrial specialization as the main factor shaping the relative stability of different regions and the labor market as the key determinant of the regional adjustment process. But a full account must surely also consider other reasons for regional crisis and restructuring and mechanisms other than labor market flexibility in order to explain the degree of and differences in regional adjustment.

There is, then, considerable scope for a potentially fruitful cross-fertilization of ideas between Krugman's geographical economics and the new industrial-economic geography, and for the elaboration of each. Both draw heavily on a Marshal-

lian view of industrial localization. But whereas the new industrial geography has sought to reinterpret the Marshallian account in terms of transaction cost economics, Krugman instead has tried to link Marshallian industrial localization with the economics of imperfect competition, increasing returns, path dependence, and cumulative causation. These concerns were at the center of Nicholas Kaldor's (1978, 1981, 1985) earlier seminal work on trade, endogenous growth, and regional development, a debt that Krugman acknowledges:

This clear dependence on history is the most convincing evidence available that we live in an economy closer to Kaldor's vision of a dynamic world driven by cumulative processes than to the standard constant returns model. (1991a, 9–10)

Krugman even goes so far as to admit that in a sense his own work is only "a repetition" of Kaldor's ideas. There are significant differences between the two, however. In his quest for economic rigor, Krugman's mathematical formalization of the processes of industrial agglomeration and uneven regional development has taken him away from the richness of Kaldor's original approach toward the limited abstract landscapes of regional science. Indeed, in *Development, Geography and Economic Theory* (Krugman 1995) and *The Self-Organising Economy* (1996), his role model seems to be that doyen of regional science Walter Isard, rather than Nicholas Kaldor, who, one suspects, would have been extremely skeptical of the unrealistic, deductive model-building that is the hallmark of the regional science tradition. And despite Krugman's apparent agreement with Kaldor's argument for the "irrelevance of equilibrium economics," the ghosts of constrained maximization and equilibrium solutions still haunt much of his analysis.²⁴

²⁴ The same is true of the new trade theory and the new endogenous growth theory more generally. Many of the ideas found in these

There would be much to be gained, in our view, if both Krugman's geographical economics and the new industrial and economic geography revisited the method and the message of Kaldor's work. But that, as Krugman would say, is another story.

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theories were in fact anticipated by Kaldor. But whereas he eschewed the deductive and mathematical for the inductive and realistic (as expressed in his emphasis on "stylized facts" and nonequilibrium), the new theorists have deliberately sought to "systematize" his ideas through mathematical formalism and appeal to all-embracing principles of optimizing economic behavior (see the assessments by Kitson and Michie 1995; Skott and Auerbach 1995).

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