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This article appraises the conceptual foundations of the new international division of labor (NIDL) literature. According to NIDL, the observed shift of international production from developed to less developed nations can be explained by an international vertical fragmentation of production in which different phases of production are undertaken in different nations, often by the same firm. The purpose of this review is to examine the conceptual issues surrounding this theory, to analyze NIDL's intellectual relationship to key economic theories, and to draw a conceptual critique.

Over the past twenty to thirty years, an important change has been slowly taking place that was hardly noticed at first. This change is the shift of a large share of the world's manufacturing production from the highly developed industrial countries of North America and Western Europe to developing countries, particularly in Asia. Some view this as a cause for concern, a sign that the rich industrial nations are losing ground. Others see it as a positive development that will benefit all nations engaged in trade. All agree, however, that established theories of economic development and international trade have not been of much help in explaining or anticipating this change. Therefore, these theories are being questioned and revised, and new theories are being proposed.

One of the theories that has been offered as a better explanation of the past and a better guide into the future is referred to as the new international division of labor (NIDL). According to the theory, the shift of international production from developed to less developed countries can be explained by an international vertical fragmentation of production in which different phases of production are undertaken in different nations, often by the same firm. The subdivision has occurred because of changes in transportation and communication technologies and the existence of a pool of low-wage workers; these changes work within a setting of capital mobility and profit maximization. The implications of the theory are follows: increases in manufacturing activities in less developed places, deindustrialization of developed places, decentralization of production while control continues to be centralized, continued dependency of less developed places, and intensified pressures of competition in product and labor markets everywhere.

Although much of the NIDL literature is primarily descriptive of the phenomena, the concern of this article is with NIDL as a theory and its intellectual roots.

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Accordingly, the purpose of this article is to examine the conceptual issues surrounding this theory. To set the stage for such an examination, the article first reviews definitions and implications associated with NIDL. An investigation of the conceptual issues, analysis of NIDL's intellectual relationship to key economic theories, and a conceptual critique follow.

THE NEW INTERNATIONAL DIVISION OF LABOR DEFINED

Although elements of NIDL preceded their work, Fröbel and colleagues (1980, 1978) are considered to be the keystone authors, and we therefore turn to them to set the basic definition and scope of the concept:

> For the first time in the history of the 500-year-old world economy, the profitable production of manufactures for the world market has finally become possible to a significant and increasing extent, not only in the industrialized countries, but also in the developing countries. Furthermore, commodity production is being increasingly subdivided into fragments which can be assigned to whichever part of the world can provide the most profitable combination of capital and labour. . . . The term which we shall use to designate this qualitatively new development in the world economy is the *new international division of labour*. (Fröbel et al. 1980, 13-14)

Fröbel and colleagues' conceptualization of NIDL is based on two developments: (1) an increase in the existence of manufacturing industries that produce in developing countries for world markets and (2) a subdivision of production into ever smaller steps. The first of these two developments has received much attention. It has stimulated research on multinational firms (Busch 1974; Caves 1971; Kindleberger 1970, 1969) and product cycle theory (Vernon 1979, 1966, 1960; Wells 1969). The increased subdivision of labor into small steps, on the other hand, has not generally been identified as an important factor contributing to the rise of multinational firms.

Fröbel and colleagues (1978) view three conditions as basic to the worldwide reorganization of manufacturing: a large labor pool in less developed nations, modern technologies of transportation and communication, and the international fragmentation of production tasks. With regard to the first condition, Fröbel and colleagues (1978) point to the millions of potential workers in developing countries whose wages are 10-20 percent of those of workers in industrial countries even though their working day is longer and their productivity is generally comparable. In addition, this labor force can be hired and fired with virtually no constraints. The second condition, changes in technology and communication, has reduced the dependence of industrial locations on geographical factors. The development of specialized carriers for both bulk and delicate goods frees up physical production locations; modern telecommunications systems free up data processing and other organizational activities from traditional locations in industrial countries. The third condition, the decomposition of complex production processes to allow the use of unskilled labor, now makes specialization economical in international blocks, with differing levels of subcomponent production and assembly activities taking place across international boundaries.

With these preconditions set forth, NIDL proponents claim that a new form of expansion and accumulation of capital began during the 1960s, a form in which a single market for labor and a world market of industrial sites emerged. Thus, they claim that for the first time the production of semiprocessed and processed manufactured goods was located in underdeveloped countries and designed to be sold on world markets. Historically, the first less developed countries to attract NIDL capital were those with cultural, geographical, or commercial linkages to traditional industrial centers. The transfer of European production to the peripheral countries of Ireland, Greece, Portugal, and Turkey is cited along with the relocation of U.S. production to Mexico and Puerto Rico and the transfer of Japanese production to South Korea and Taiwan.

Fröbel and colleagues (1980) support their hypotheses empirically with a case study of the West German textiles and clothing industry, an overview of overseas German manufacturing subsidiaries, and an examination of free production zones and world market factories in one hundred less developed countries. They cite four factors that may slow the trend toward NIDL: (1) the low cost of using existing facilities, (2) concessions granted by the state and unions in the industrial countries to induce capital to stay at home, (3) "political instability" in some regions of the third world, and (4) the possibility (in some cases) of securing the same or even higher profits through rationalization schemes in the traditional industrial centers rather than through relocating production in a low-wage country (Fröbel et al. 1978, 850).

These obstacles not withstanding, Fröbel and colleagues (1980, 1978) project the continuation of worldwide reorganization of production and note a number of economic consequences. First, the partial development of export-oriented manufacturing in less developed countries will keep these areas dependent on the industrial nations. Second, there will be a deindustrialization of traditional industrial countries. Third, there will be a decentralization of manufacturing processes away from traditional areas associated with a concentration of production of each product at a few third world sites. Fourth, unemployment and pressure on real wages will increase everywhere. Fifth, there will be a continuing intensification of competition and pressures for more transnational operations. Sixth, concentration will in-

crease because multinational corporations are favored by the process.

The end result will be a world that is not divided into industrialized centers and nonindustrialized peripheries (as previously) but rather is divided into the central producers of sophisticated technology versus the peripheral producers that use standard technologies. Capital will travel rapidly among the latter sites. The decentralization of the production of a commodity among different sites and the needs of internationally mobile capital require more sophisticated coordination and control centers. Thus, the new world economy may have a few "world cities" that serve as the command, control, and information centers (Sassen 1991).

CONCEPTUAL ISSUES

Prior to comparing NIDL to other theories of trade flows and international location of production, the conceptual issues that are the underpinnings of NIDL as a theory are examined. Five of these conceptual issues are critical to the subsequent comparison: NIDL's dependence on the concept of division of labor, the assumption of factor mobility, the assumption of profit maximization, NIDL's status as a macrolocational approach, and NIDL's status as a dynamic explanation of observed phenomena.

The Division of Labor

The division of labor is the conceptually defining characteristic of NIDL, as NIDL is a theory of the international mobility of capital and multinational subdivision of production. There are two possible interpretations of the term *division of labor*. The first involves the division of tasks among individuals. Adam Smith developed this concept in *The Wealth of Nations*, first published in 1776 (Smith 1965). Using pin making to illustrate his point, Smith explained that by dividing up the production and assigning different tasks to different workers, each worker develops to the fullest the special skills required for completing a particular task (p. 7). NIDL also incorporates this meaning of the division of labor, as is clear from the work of Fröbel and colleagues (1980). To avoid confusion, this article refers to the division of labor as the division of tasks (among workers). The second meaning of division of labor is that which occurs among countries in international trade. For example, one country may specialize in the export of capital-intensive goods and the other in the export of labor-intensive goods. This division of labor is referred to as division of production (among regions or countries).

What is new in NIDL's contribution to the literature is the addition of a spatial dimension to the division of tasks that is not present in Smith ([1776] 1965). In Smith's example of pin making, workers performed their specialized tasks side by side. The whole production process, from raw material to finished product, took place in a single location. In the new division of labor, this no longer is the case because different steps can now be carried out at different locations. Note that this development does not require a division of production across national borders; it could be limited to different production sites within the same country. However, to the extent that the division of tasks is across national boundaries, it often parallels the division of production.

There is a very important difference between Smith's ([1776] 1965) and Fröbel and colleagues' (1980) views of the benefits of the division of tasks. Smith stressed the *increased* skill of each worker in performing a particular step of the production process. Although Fröbel and colleagues do not deny that the execution of a specialized task in a fragmented production process leads to workers having greater skills in performing particular tasks, they point out that this specialized skill comes at the expense of each worker having *fewer and less complex* skills. Thus, in an industry characterized by a high degree of division of tasks, unskilled workers can be taught the narrow range of necessary skills relatively easily and quickly. Fröbel and colleagues (1980) refer to this as Babbage's principle:

> Babbage's principle—a fundamental expression of the capitalist laws of motion—calls for the maximum replacement of skilled labour in order to attain a reduction in labour costs. It is implemented through the *world-wide* organised allocation of the elements of the production process to the cheapest or most adapted labour force which can be found. (p. 41)

Differences of scale and location are not the only significant conceptual differences between the division of tasks and the division of production. According to the neoclassical trade theory, the international division of production is the result of factor differences between countries and is built around the notion of comparative advantage (Heckscher [1919] 1949; Ohlin 1933). Because the comparative advantage of the economy of a region or nation is a function of its factor endowments *relative* to the endowments of other economies, countries with highly skilled and, therefore, well-paid labor forces will specialize in sophisticated, capital-intensive production. Most views of the "natural" role of developing countries in the world economy have been influenced by this model, which projects that countries with large supplies of unskilled, low-wage labor or natural resources will specialize in the production of commodities that make relatively more intensive use of those inputs (Gowland 1983). Given that the original Heckscher-Ohlin theory is based on the assumption that factors of production are not mobile, an economy's factor endow-

ments cannot be changed through migration of either labor or capital. Although the assumption never has been totally accurate, until quite recently it was a reasonable approximation for short- to medium-term policy analysis.

Although a difference between economies is the very reason for the existence of the international division of production, aptitude or skill differences among workers are not a necessary condition for the emergence of the division of labor among workers. If specializing in different tasks leads to greater productivity, then workers receive higher wages. If the net effect of better pay for performing a specialized task is a higher utility for workers, then workers would voluntarily agree to a division of labor even if initially they all have identical skills in every respect. Obviously, once the division of labor is put in place, different workers will acquire different skills, and distinctions among them will develop even if they all have identical inherent talents. Krugman (1990) extends this idea to specialization among countries. If there are inherent benefits to specialization, then there is no reason why they should be limited to individuals and not apply to national economies as well. Thus, the inherent benefits that may be derived from specialization are an additional explanation of why international trade exists.

The Assumption of Factor Mobility

The discussion of the background of the division of labor component of NIDL shows that the underlying ideas are not new at all but rather represent two well-established concepts. The word "new" in new international division of labor seems to refer only to the qualitative empirical changes, not the theory. The qualitative changes, in turn, are the result of the availability of new, more efficient transportation and communications technology as well as important policy changes in developing countries. Most important among these changes is the relaxation of restrictions on foreign ownership of production facilities and on rules against the repatriation of profits as well as the establishment of incentive programs for foreign investment into export-oriented production plants by an increasing number of developing countries. These trends are well documented (Fröbel et al. 1980). As a consequence of such policy changes, private capital mobility from developed to developing nations has increased significantly, as witnessed by the development and growth of transnational financial institutions.

International capital mobility and international division of labor and production would not have changed much without the institutional infrastructure that largely developed after World War II. This infrastructure includes agreements about international commodity exchange, taxation of international and multinational firms, and other agreements that have reduced the risks of international trade and foreign production locations. Recent innovations in international finance, which occurred in response to quickly increasing demand as the institutional infrastructure became stronger, reduced risks of investing abroad even further and made third-party financing of international ventures easier.

The Assumption of Profit Maximization Versus Cost Minimization

NIDL assumes a sophisticated decision problem involving the location of markets and the simultaneous choice of the number of distinct production steps, the location of each of these steps, and the technology to be employed at each location. These choices are made to maximize profit. Although popular discussions of capital mobility usually focus on the lower costs elsewhere, particularly labor costs, it is important to note that profit maximization is a more general decision criterion than is cost minimization. This is illustrated by the following example. In an interview, the director of an airplane manufacturer explained that one reason for expanding production in the company's branch plant in England rather than in the plant located in the company's home country was England's more liberal policy toward the export of military materials. Costs apparently played no major role in this decision (Bühlmann 1994).

That laws and regulations influence location decisions is nothing new, but they usually are not considered in theories of international capital mobility. The NIDL literature is to be credited with emphasizing this point and providing examples. Fröbel and colleagues (1980) note that differences in laws among countries may even lead to the location of highly capital-intensive production in low-wage countries, an outcome that at first glance seems to contradict established theories. They point out, as an example, that some European countries have laws prohibiting women from working night shifts.[1] In industries employing mostly women as machine operators, such as the textile industry, these rules make three-shift operations difficult or even impossible. Some German textile firms, therefore, transferred highly automated production plants to developing countries where they could be used around the clock so that the *productivity of capital* was higher than it would have been in Germany.

A Macrolocation Theory

NIDL is primarily a theory of capital mobility, not a theory of the location of production. That is, its focus is on the conditions that enable and encourage the international mobility of capital. The theory's im-

plications regarding the location of production are fairly general. This is in part because NIDL's fundamental unit of analysis is the firm, even though the focus of the empirical research is on industry-wide and macroeconomic phenomena. To make specific statements about the investment decisions of the firm and the location of its production, one would need specific information about the firm on issues such as inputs, products, markets for inputs and outputs, production technology, and costs. Without such information, the theory will be more useful as an explanation of international capital mobility in general than as a theory of location.

Dynamics

In NIDL, the change in technology and production processes upsets equilibria and leads to change. These two dynamic elements are complementary. Changes in technology may make possible new production processes, and new technology may lead to product innovation. New processes may lead to additional innovations so that a certain degree of simultaneity is likely to exist, creating a dynamic that may not lead to a new static equilibrium.

THE RELATIONSHIP OF NEW INTERNATIONAL DIVISION OF LABOR TO OTHER ECONOMIC, GEOGRAPHIC, AND SOCIAL THEORIES

Although NIDL cannot be considered an integral part of the body of either neoclassical economic theory or location theory, it is important to examine it with respect to its elements of commonality with and contrast to both traditional theories and challenges to traditional theory. In this review, NIDL is compared to neoclassical trade theory, product cycle theory, and the theory of the multinational enterprise in terms of a number of attributes. The basis for comparison of NIDL to these theories is their use of the concept of division of labor; their static or dynamic design; their macroeconomic versus microeconomic foci; their incorporation and conceptualization of spatial organization, market structure, strategic behaviors, profit maximization, and cost minimization; and their assumptions about the organization of production.

Neoclassical Trade Theory

The works of Heckscher and Ohlin are seminal to all of modern trade theory (Findlay 1995; Ohlin 1933; Heckscher [1919] 1949). The Heckscher-Ohlin theorem is based on the observations that countries have different compositions of factor endowments and that production among countries is distinguished by the different relative intensities by which factors are combined. Therefore, countries export those commodities that require a large amount of relatively abundant inputs and import those commodities that require relatively scarce inputs in their production; as a result of trade, commodity prices are equalized among the trading partners. The concepts of factor intensity and factor abundance are defined and addressed in a two-country, two-factor, two-product model. Assumptions follow the Ricardian tradition; commodities are freely traded, but factors of production are internationally immobile. The basic model also assumes an absence of returns to scale, identical technology, uniform quality of factor inputs, and homothetic patterns of taste. The proposition is based on the concept of general equilibrium (Carbaugh 1995).

Although thousands of works have critiqued, challenged, or extended this basic theorem, for the purposes of this article, only a handful of major contributions are noted. The first is Samuelson's (1949, 1948) celebrated factor price equalization theorem, in which he showed that trade would drive wage rates to equality in two countries that are engaged in trade. Samuelson's other contribution, the Stolper-Samuelson theorem, projected the impact of protection on terms of trade and the intracountry factor markets (Stolper and Samuelson 1941). Similarly, the Rybczynski theorem more fully detailed the relationship between factor endowments and commodity outputs (Rybczynski 1955).

The neoclassical trade model depicts trade as taking place in a setting of profit maximization, factor immobility, and price and wage flexibility. It is a static equilibrium model, presupposing an unchanging state of technology; it also projects no locational implications with respect to production. Similarly, in the basic model, no account is taken of the existence of economies of scale, product differentiation, or intra-industry trade. Because the original Heckscher-Ohlin theory is based on the assumption that factors of production are not mobile, an economy's factor endowments cannot be changed through migration of either labor or capital. Some of the foci of recent research in the tradition of neoclassical trade theory have been the relaxation of the assumption of immobile factors of production and the introduction of human capital differences and trade barriers (for an excellent summary of this research, see Findlay 1995). Another important recent extension is the introduction of economies of scale to international trade theory (Krugman 1991).

The neoclassical trade theory never was without significant criticism on both theoretical and empirical grounds. First, note Leontief's paradox, which refers to the event of factor intensity reversal (Leontief 1954); his empirical results indicated that U.S. exports were being produced by labor-intensive techniques. Kenen (1965) offered a possible explanation of Leontief's paradox by incorporating human capital into the empirical analysis. The empirical results of other scholars lend support to Kenen's finding that U.S. exports were relatively

capital intensive if human capital is added to physical capital (Findlay 1995).

In comparing NIDL and neoclassical trade theory, it is important to note that the Heckscher-Ohlin model does not rely on the existence of capital mobility; by contrast, the existence of the *new* international division of labor requires it. As already mentioned, early versions of the neoclassical trade theory assumed the absence of any mobility of factors of production. Findlay (1995) traces the development of the model back to a response by Heckscher to concerns of fellow Swedish economist Knut Wicksell. Wicksell worried that free movement of commodities and factors of production in response to international price differentials could lead to the depopulation of Sweden. Heckscher developed a model of international trade to demonstrate that emigration was not inevitable given that international trade alone could bring about the equalization of factor prices (Findlay 1995). Thus, the initial purpose for developing the theory differs significantly from that leading to the development of the theory of the NIDL. The different foci of the two theories also are expressed by their respective units of analysis. In the case of NIDL, it is the firm (although the concerns that the theory addresses have a macroeconomic focus); in the case of neoclassical trade theory, it is the national economy.

Product Cycle Theory

Product cycle theory was first developed as an explanation for the existence of multinational firms with branch plants in many countries (Vernon 1966) because the existence of branch plants of technologically sophisticated firms could not be explained by the neoclassical theory of international trade. Applications of product cycle theory were later expanded to explain not only the production of manufactured goods in developing countries but also what took place in the relatively backward regions of industrialized countries. The development and critiques of product cycle theory as it relates to nonmetropolitan manufacturing employment in the United States are reviewed by Mack and Schaeffer (1993). Two new elements distinguish product cycle theory from neoclassical theory of international trade. Like NIDL and recent versions of neoclassical trade theory, product cycle theory drops the assumption that the production factor capital is immobile. The second new element in product cycle theory is the consideration given to production requirements so that a commodity can succeed in the marketplace.

According to product cycle theory, when a firm introduces a new commodity, there are few, if any, competitors. Therefore, production costs are not the sole decisive factor in locating the production facility. Competition with other firms, when it exists, is primarily in the form of product innovation rather than price competition. In the early stages, because of ongoing product development, production processes are changing continually. Therefore, access to technical, management, and marketing services is critical, and the nonstandardized production processes require a skilled labor force. Such requirements favor a location in a highly developed region. As the product begins to gain market acceptance, the volume of production increases, allowing for economies of scale. Eventually, as the product matures, production processes become standardized, lowering the demand for skilled labor. Access to technical and management capability also becomes less important. Finally, in the last stages, when the product has reached maturity and other firms have developed competing products, success in the market depends almost exclusively on price and hence on cost. Because routine production, which has been well established by this stage, allows the process to be performed by low-wage, unskilled workers, firms will transfer production to a region with an abundant supply of low-wage workers. In the United States, the rural regions traditionally have attracted late-stage production; today, such production is increasingly taking place in developing countries.

Because labor in developing countries is very cheap, these places will attract more labor-intensive, late-stage production plants than will regions in industrialized countries. Thus, product cycle theory predicts that developed countries will tend to export capital-intensive commodities and import labor-intensive commodities from developing countries. This result is compatible with the projections of neoclassical trade theory. However, product cycle theory and NIDL are more fundamentally different.

NIDL shares with product cycle theory the assumption that capital can move freely between economies. But unlike product cycle theory, NIDL does not assume that only commodities in the late stages of development will be produced in developing economies. Instead, it introduces an element that is absent in product cycle theory, namely, the fragmentation of production into many steps that can be performed independently. In other words, NIDL bases the international division of production on production processes. It is not dependent on the product cycle but potentially applies to the production of goods at all stages of development.

Product cycle theory, in its basic version, assumes a production location decision based on only one decision variable: production cost, particularly of labor. Thus, cost minimization is the driving force. Product cycle theory predicts that production of mature goods will be moved to an economy with a supply of cheap, unskilled labor only because the expense of skilled workers would be unnecessary at this stage in the product cycle. It does not assume that the production process might be

different depending on the location and on the cost and skills of the labor force. If relocation of production were not possible, then either production would cease because it would be unprofitable or production would be carried out in the same way and with the same technology as if it had been moved. By contrast, NIDL assumes the fragmentation of the production process and predicts that the choice of technology for the performance of each step in the production process depends on the skills and cost of available labor.

Thus, NIDL and product cycle theory share only superficial similarities; they offer, in fact, two distinct explanations for the growth of manufacturing in developing countries. Although NIDL is presented by Fröbel and colleagues (1980) as an explanation of large investments in developing countries by firms with headquarters in developed countries, the previous two examples show that it is a general theory of plant location. It can explain not only the relocation of manufacturing production to developing countries but also the existence of branch plants of the same firm in different developed countries with similar labor and capital costs. By contrast, the explanatory power of product cycle theory is much more limited in this respect.

Finally, both NIDL and product cycle theory are different from neoclassical trade theory. The latter is static, making it possible to make statements about the division of production and international exchange in equilibrium. There is no dynamic element endogenous to the model to disturb this equilibrium. By contrast, both NIDL and product cycle theory are dynamic. Both theories use the firm as their unit of analysis, while the unit of analysis in neoclassical trade theory is the national economy.

The Multinational Enterprise Theory

NIDL not only has roots in trade theory and in the macroeconomics of aggregate investment, it also has a place within the body of industrial organization and the multinational enterprise (MNE) theory. In tracing these roots, the focus is on the development of theories that explain the decision to invest abroad, taken at the industry and the firm level.

Economics moved into the MNE theory from the confines of neoclassical trade and financial theory only relatively recently, considering the two hundred-year-old development of trade theory. Hymer's 1960 dissertation marked the first change from prevailing explanations to a focus on multinational firms and their decisions (Hymer 1976). Until that time, capital movements had been explained by neoclassical finance theory of production rather than as a function of international exchange. This allowed Hymer to explain why firms transfer intermediate goods among international production sites while maintaining title to the goods. Therefore, he was viewing direct investment of the firm and industry in its international context. Three reasons for international investment were offered: By horizontal expansion, the firm has an advantage over local firms; by vertical expansion, the firm can limit international competition; and by investing in different economies, the firm can better manage risk (see Dunning and Rugman 1985).

Caves (1971) cited the same three reasons and made it clear that "foreign direct investment occurs mainly in industries characterized by certain market structures in both the 'lending' (or home) and 'borrowing' (or host) countries" (p. 1). Caves specifically mentioned two different market structures: oligopoly with product differentiation and oligopoly without product differentiation in the home country. In the first of these two cases, horizontal investments may take place to produce the same good or goods in the foreign country as at home. This is a particularly likely occurrence when high transportation costs separate regional markets or when scale economies at the first production location are exhausted (see also Kindleberger [1969] regarding the role of economies of multiplant operations). In the second case, vertical direct investment will occur. One of the important conclusions of Caves' argument was that not all industries will undertake direct foreign investments. In the case of the NIDL model, the question of which types of firms are most likely to make direct foreign investments can be answered only empirically and does not follow from the theory.

MNE theory was moved closer to the NIDL explanation by the work of Dunning (1988, 1981, 1979), who also offered three explanations for direct foreign investment: The firm has net ownership advantages over other firms in serving specific markets, the firm increases profits by internalizing these advantages over other firms, and the firm increases profits by exploiting advantages that stem from factor inputs. Internationalization theory, as advocated by Buckley and Casson (1976), Rugman (1986, 1981), and Teece (1986), was the next step in the development of MNE theory. In a manner reminiscent of Coase's (1937) theory of the firm, these authors explained that the firm internalizes activities to avoid transaction costs. They argued that because of market failures, it is preferable to maintain ownership of intermediate stages under the firm's administration.

MNE is not a general theory; it is essentially eclectic, drawing not only from the neoclassical theory of the firm but also from elements of imperfect competition, locational advantages, and ownership advantages. Because it treats spatial organization as a component of strategic behavior, it depends on the assumption of capital mobility. Early in its development, MNE theory focused on production-based explanatory elements; only with Caves's (1971) contribution were demand-

TABLE 1. Comparison of Major Model Characteristics

	New International Division of Labor	Product Cycle Theory	Multinational Enterprise Theory	Neoclassical Trade Theory
Treatment of time	Dynamic	Dynamic	Static	Static; general equilibrium
Unit of analysis	Firm or industry	Firm or industry	Firm	National economy
Special focus areas	Production	Production	Market share	International trade
Competitiveness	Profitability	Absolute cost advantage	Market share; price	Relative cost advantage
Organization of production	Production process; firm's spatial organization	Firm's spatial organization	Firm's spatial organization	International division of production
Market structure	Competitive markets are usually implied	Competitive markets	Oligopoly possible	Competitive markets
Strategic decisions	Location of production; organization of production steps; choice of technology	Location of production (particularly late-stage products)	Location of production	Laissez-faire
Costs of factors of production		Cost of labor		Relative factor prices; relative factor endowments
Laws and regulation	Investment incentives; labor laws; other laws and regulations			
Optimization principle	Profit maximization	Cost minimization	Profit maximization	Pareto optimality
Mobility of factors of production	Capital required; labor possible	Capital required; labor possible	Capital required; labor possible	Capital possible; labor possible

NOTE: The table reflects the most commonly used assumptions and, therefore, does not account for extensions to these theories that have not become part of their "standard" formulation. Also note that an empty field does not necessarily indicate that the theory is incapable of considering that item; rather, it only indicates that the theory usually does not.

side components brought into causality roles. On the other hand, until Caves (1971) and Dunning (1981, 1979) introduced vertical elements as explanatory variables, MNE theory viewed international expansion of the firm as primarily a horizontal expansion of production.

There are several key differences between MNE theory and NIDL. First, the developments described constitute a theory of MNE that is essentially static. Vernon's (1966) product cycle approach was the sole attempt to incorporate dynamics into the theory. The dynamics are the result of modifications to the product and production process over time. Second, MNE theory depends on demand elements to a far greater extent than does NIDL, which is primarily production based. Third, differences arise from the treatment of division of labor in that NIDL is based on both Smithian (what this article calls the division of tasks among individuals) and production-based divisions of labor, while most MNE literature does not extend beyond the Smithian division. Finally, although the firm is the unit of analysis of both NIDL and MNE theory, the latter is primarily a theory of the firm, while NIDL considers the impact of the behaviors of firms on an industry or economy. In all, when theoretical attributes of NIDL and MNE theory are compared, the primary difference between the two is the production process basis for the division of labor in NIDL.

Summary of the Relationship of NIDL to Other Theories

Table 1 summarizes the key points of comparison among NIDL, neoclassical trade theory, product cycle theory, and MNE theory. Attributes of the models are listed by row. It is evident from the table that the neoclassical model differs from the other models far more frequently and significantly than the other models differ among each other. This would be expected in light of the mutual purpose behind the development of NIDL,

product cycle theory, and MNE theory, namely, to explain those observed trade patterns that are not explained by the neoclassical model.

CRITIQUES OF NEW INTERNATIONAL DIVISION OF LABOR

As in many fields of intellectual endeavor, some of the most incisive criticisms of NIDL originate with individuals performing research in the specific area or in closely related fields. This review of the criticism of NIDL builds on the reflections of economists and regional scientists who have published significant analyses in the areas of NIDL, product cycle theory, and MNE theory as well as in the broad area of Marxist thought.

Schoenberger (1988) develops a critique of NIDL based on her research into technological and organizational changes in the multinational corporation. She credits the NIDL literature for tying together the previously separate tracks of the literature of industrial location and that of regional development. The NIDL literature also is important for its conceptual recognition of the interaction of corporate structure, spatial patterns of investment, and technological change. However, Schoenberger finds that NIDL is not a generalizable model of spatial patterns of international investment because of its restrictive conceptualization of the roles of competition, technological change, and location vis-à-vis markets.

Schoenberger (1988) finds that the NIDL literature overemphasizes the importance of production cost. She challenges the premise that production is increasingly or systematically fragmented to employ cheap unskilled labor, and she points to the persistence of skilled labor demand in the industries and the delinking of functions according to skill category. She also refers to the work of Sabel (1982) and Shaiken (1984), who note that although automation does reduce skill requirements in the firm's production process, there is greater reliance on skilled workers to design, install, and maintain these automated processes. Pointing to advantages of "just-in-time" production practiced by the Japanese automobile industry, Schoenberger (1988) stresses that cost-saving production processes can lead to spatial changes that are not a function of labor cost.

Second, Schoenberger (1988) reminds us of the demand side as a traditional determinant of the location of production, claiming that much peripheral location of production takes place for the purpose of serving peripheral markets. (The MNE literature also makes this argument.) Such locations are particularly likely to be chosen when there are highly differentiated national markets or when one negates the presumption of NIDL that production processes and products are fixed after the initial stages. (In this respect, NIDL follows product cycle theory.) Continuing development of product and process requires both forward and backward linkages and flexibility on the production side. In her 1986 work, Schoenberger mentions that the distinction between products in terms of the level of technology is not as crucial as the distinction between standardized and nonstandardized production processes. She adds that the NIDL model also fails to incorporate a suitably complete analysis of the differing ways in which firms compete (Schoenberger 1986). This last point is reminiscent of the MNE literature, which focuses on market structure and position.

Finally, Schoenberger's previous studies of the spatial organization of specific industries add support to her critique of NIDL. Her 1987 study of the spatial implications of technological and organizational changes in the automobile industry concludes that the adoption of flexible automation technologies may foster the spatial reintegration of production, in contrast to the earlier trends toward decentralization. The basis for this conclusion is the analysis of competitive strategy. If the concept of competition is broadened beyond price competition, strategies can be based on product design, highly differentiated markets, and the segmentation of markets (Schoenberger 1987). Similarly, her work on competitive strategies in the electronics industry (Schoenberger 1986) leads to the conclusion that product standardization implies a reversal of labor-cost-driven decentralization. This is particularly poignant in an industry that is referred to as the archetypical example of NIDL.

Henderson's (1987) critique of NIDL focuses on several of the same flaws that Schoenberger points out. Specifically, he finds that in assuming that dispersion of production is primarily a result of capital accumulation processes, NIDL authors undervalue the role of indigenous government and social forces in the economic development process. NIDL also does not adequately take account of markets in locational decision making. In his study of the semiconductor industry, Henderson (1989) points to Hong Kong, Singapore, Taiwan, and South Korea as cases that illustrate this point of criticism.

Cohen (1987) offers one of the most comprehensive and systematic evaluations of NIDL. He notes three major problem areas: conceptual problems, historical gaps, and empirical omissions. In his discussion of conceptual problems, he notes (as the present article points out) that *division of labor* has different meanings. He may be too harsh in this regard. It is clear that Fröbel and colleagues (1980) were aware of this point. In the conceptual part of their book, they clearly distinguish between division of production and division of labor. Using the same term for both has resulted in some confusion.

Another point raised by Cohen (1987) is that NIDL theorists "use measures of the migration of capital to measure changes in the division of labour" (p. 230). A better measure, in his opinion, would be "measurements of the movement of labour to indicate changes in the division of labour" (p. 230). This is an important point in that the movement of capital does not by itself indicate a change in the nature of the division of labor. The times of Adam Smith, when all steps from raw materials to final product were performed at one site, are long over; spatial division of labor has become common. According to Cohen, the movement of branch plants from developed to developing countries is thus only a change in magnitude. The focus in much of the NIDL literature on labor costs is a distraction from the full consideration of the important role of innovation and technological development (Cohen 1987; see also the earlier discussion of product cycle theory vs. NIDL). It may be premature, however, to completely dismiss the appropriateness of using capital mobility. Although it does not measure changes in the division of labor, it does indicate changes in the division of production between countries. Cohen's critical comments do, however, focus attention on the absence of consideration of labor mobility in the NIDL literature. Given the relatively high degree of international labor mobility (Organization for Economic Cooperation and Development 1973-94), this is an oversight that should be corrected.

A second thrust of Cohen's (1987) critique is historical. He points out, "On prima facie grounds, it would seem appropriate to assume that imperialism and colonialism had something to do with the evolution of the present-day international division of labor" (p. 233). He distinguishes three periods for further investigation. The first period is based on the mercantile division of labor (Cohen appears to be talking about what the present article calls the division of production), which makes use of natural advantages in trade. For example, during the first period natural products, such as certain furs, were brought from Poland to Western Europe. What happens then is

> that once a regular market develops with implied forward contracts, production methods are bound to adjust to meet anticipated demand. It is thus quite fallacious to assume that mercantilism implies pure exchange without any implication for the organisation of production. (pp. 234-35)[2]

The second period identified by Cohen is the industrial division of labor. He reminds us that this is not only the period when the division of labor developed much more fully in large manufacturing plants but also a period of infrastructure investments such as the

> internationally-financed canals in Suez and Panama, transcontinental and local railways, inland waterways, better roads, the building of great civic buildings in the industrial centres and the provision of working class housing. (p. 237)

Some of this infrastructure still plays important roles in national and international trade.

Cohen (1987) calls the third period the imperial division of labor, an international division of production between colonies and colonial powers. During this period, significant investments were made in today's developing countries using some of the advanced technology of that time, particularly in transportation.

Finally, Cohen (1987) calls the last historical period the transnational phase and attributes its emergence to the gradual collapse of the European empires. To bolster his arguments, Cohen quotes a nineteenth-century German economist, Dietsel: "The international division of labour in trade, in the output of raw materials and in agriculture is growing at such a pace that in the long run the isolation of individual groups is no longer possible" (p. 240). Based on this historical account, Cohen argues that NIDL is misnamed and should instead be called the "changing international division of labor."

Cohen's (1987) discussion of the empirical evidence is of less interest here. However, the links he makes between NIDL and contemporary domestic and international migration and the growth of service jobs in developed countries are noteworthy. (On this latter point, see the work of Sassen-Koob [1983] and Sassen [1991, 1988].)

Contemporary Marxist critics hold differing views of NIDL. Some see it as complementary to Marxist theory; others see it as primarily conflicting. Jacobson and colleagues (1979) view NIDL as an extension of Wallerstein's thesis that capitalism has always depended on an international division of labor, with production of goods taking place in the industrialized countries and production of raw materials taking place in the third world. When NIDL locates production in the third world, there still exists the same degree of dependency. In examining the role of the state, Marxist critics inquire whether political strategies should be directed at a general concept of the state or at specific nationalistic states (Jacobson et al. 1979).

A second concern within a Marxist context is the relationship of dependency and the developmental process to NIDL. Does NIDL lead to economic development of the third world or merely to increasing levels of dependency? Under previous Marxist thought on the "old" international division of labor, dependency was assured because the core needed the periphery as an outlet for the export of its surpluses and because the wealth produced in the periphery was transferred to the core as a result of the inequalities of exchange. If NIDL does lead to development, then the question for Marxist dialogue becomes one of whether to criticize NIDL for

the level of exploitation of third world workers or whether to accept and encourage NIDL as leading to the required stage of development that can serve as the springboard to socialism. These questions hinge on the development of thought surrounding the issues of whether dependency is increasing or decreasing, whether NIDL promotes economic development, and the nature of changes that are evoked.

Lipietz (1986), in his excellent review of the history of Marxist thought on this issue, refers to the NIDL as "peripheral Fordism."[3] The Fordism element results from the combining of capital accumulation and market growth in the periphery. Yet, it is peripheral in that the qualified employment positions remain in the core, external from the periphery. Lipietz notes the emergence of a duplication of the NIDL theme in that wage increases in the first tier of newly developing peripheral economies make them less competitive and therefore drive poorer countries into NIDL development.

Liodakis (1990) reviews the theories and implications of development/dependency themes from the perspectives of different schools of Marxist thought. He classifies Fröbel and colleagues (1980) and Krugman (1981) as structuralists, employing the neoclassical framework to relate North-South polarization to locational shifts in production or to technological and other exogenous factors. Liodakis (1990) points out, "They fail . . . to grasp the social and historical specifics of capitalist development and thus fail to give a satisfactory explanation of uneven development" (p. 190).

After so peremptorily dismissing the structuralists, Liodakis (1990) turns to "neo-Marxist" explanations, attributing uneven development either to a surplus transfer involved in the reparation of profits or to unequal exchange with respect to the terms of trade. In either case, the root source of uneven development is NIDL. As Liodakis notes, neo-Marxist writers of the Monthly Review school[4] do not depend on the labor theory of value, the social relationships of production, or the concept that capitalism is a historically determined mode of production; rather, they emphasize the role of international commodity exchange in the expansion of capitalism (see, e.g., Amin 1976). Similarly, there is a tendency for neo-Marxists to ignore the role of class contradictions and to emphasize contradictions inherent in the core-periphery or North-South split.

Liodakis's (1990) own approach rejects the neodevelopment elements of previous analyses and is based on the international distribution elements of exchange and the NIDL. Specifically, he finds the uneven development to be determined by the structural characteristics and the overall development potential. Development can differ among less developed countries, and unequal development is enhanced by transfers of value and the character of international exchange and the international division of labor. As for policy implications of the resulting uneven development, balance of payment deficits, and external debt, Liodakis finds that neither import substitution nor export promotion will lead to an adequate restructuring, and he calls for a new international economic order in which gains from NIDL are shared more equally.

SUMMARY, REFLECTIONS, AND IMPLICATIONS

NIDL depends on established theoretical concepts such as comparative advantage and division of labor, concepts firmly rooted in the tradition of neoclassical economics. Therefore, the new contribution of NIDL lies not in the creation of new theoretical ideas but rather in the novel integration of those already existing.

As a theory, NIDL has several weaknesses. The current NIDL literature explains the location of manufacturing production for the world market in developing countries in terms of the division of tasks, the division of production, and the revolution in information technology (Fröbel et al. 1980, 13-14). However, because NIDL is defined in terms of an outcome, strictly speaking at least, some other explanation yielding the same outcome would also be part of the NIDL literature. This makes NIDL difficult to test empirically. Because changes in the division of tasks and production are technology driven, the "newness" of the contributions of NIDL is based not on theoretical constructs but rather on observing and interpreting the effects of technological change.

The changing international division of labor described by NIDL also can be explained by other theories, such as product cycle theory or those models based on the theory of comparative advantage that incorporate factor mobility. Therefore, it is difficult to judge the merit of NIDL in explaining the changing global distribution of production. Although the empirical studies in the NIDL literature offer interesting case studies, examples, and anecdotal evidence, they do not provide rigorous statistical tests of the theory. The theory also fails to provide a clear framework in which to determine what data should be collected. Therefore, the comparability of the results of different empirical studies is questionable.

Finally, the lack of a clear definition that distinguishes between the two meanings of division of labor has led some authors to use the term NIDL in ways that do not seem to reflect the theoretical explanations put forward by Fröbel and colleagues (1980). This is particularly true for some of the empirical studies of labor conditions in the U.S. electronics industry.

One of the interesting questions implicit in the NIDL literature that does not seem to have been explored yet is the relationship between the division of tasks and technological change. This relationship should be of

interest. First, the increased division of tasks (Babbage's principle) most likely *requires* adjustments in the production technology. Second, such changes are more likely to occur in markets experiencing product or process innovation. Without such innovation, savings from new production technologies would have to be large enough to outweigh the sunk cost (fixed cost) of existing technology. In other words, there may be a causal relationship among product innovation, process and technological innovation, and changes in the division of tasks. This (tentative) argument contradicts product cycle theory, which predicts that only production during the late stages of product development would be transferred to developing economies. However, the argument is compatible with some casual evidence, such as developments in the production of television sets, which changed significantly after most of the industry located to Southeast Asia.

Although there may be a causal relationship between product innovation and changes in the division of tasks, there also may be a relationship between the division of tasks and product innovation. By breaking the production process down into basic steps, each step becomes less tied to a particular product than to a specialized skill that can be used in the production process of a variety of commodities. This reduces the setup costs of the production of a new good and should, therefore, encourage product innovation by reducing its costs.

Although NIDL has a number of shortcomings, it also has a major strength. As explained earlier, NIDL is compatible with neoclassical trade theory, product cycle theory, and MNE theory. Therefore, it could serve as a framework that integrates the most important elements of each of those theories to provide a more comprehensive explanation of international trade and the global division of production.

In trying to deduce possible policy implications from NIDL, the theoretical and empirical weaknesses described in the preceding cannot be ignored. Until future research corrects the most important of these weaknesses, any conclusions must be regarded as tentative, even speculative. One implication of NIDL theory deserves special attention, however. Compared to earlier theoretical contributions, NIDL predicts much more dramatic changes in the global distribution of production. The potential importance of this implication calls for both more empirical research and more theoretical research, so that policymakers will not continue to be surprised by unfolding events but can anticipate and prepare for at least some of them.

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NOTES

1. Most of these laws are currently being reviewed or already have been dropped. The United States eliminated such laws during the 1950s (Fogel 1984).
2. The context of the quote suggests that Cohen is not using the term *mercantilism* to describe a policy toward foreign trade; rather, he is only indicating the existence of market institutions facilitating the exchange of commodities between countries.
3. Fordism refers to assembly line industrial production on a large scale.
4. The Monthly Review Press is an influential Marxist publisher.

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