

# Dependency or Institutions? Economic Geography, Causal Mechanisms, and Logic in the Understanding of Development

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**Abstract** What explains the global distribution of growth and economic activity? Proponents of unit-level explanations dismiss systems-level arguments like dependency and world systems theory for logically incorrect reasons. They argue that these system-level arguments lack the precise mechanisms that various unit-level arguments provide. But the absence of precise system-level causal mechanisms in *some* system-level theories does not logically imply that *all* system-level theories are wrong. Economic geography provides system-level theories with precise mechanisms that comport with most of the economic predictions offered by dependency theories. This does not mean that unit-level theories are either wrong or useless, but rather that unit-level explanations must (1) claim that the new economic geography is totally wrong, or (2) show how system and unit-level mechanisms interact causally, or (3) argue that unit-level mechanisms are independent of system-level causal mechanisms.

**Keywords** Economic development · Economic geography · Causal mechanisms

## Introduction

What explains the global distribution of growth, income, and economic activity? Four recent articles in *Studies in Comparative International Development* precisely capture the debate, albeit without resolution (Arrighi et al. 2003; Amsden 2003; Arrighi 2003; Haggard 2004).<sup>1</sup> Put crudely, Arrighi, Silver, and Brewer (ASB), (2003; Arrighi 2003) make a *systemic* argument that the core-periphery income divide has persisted despite considerable, if geographically limited, industrialization

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<sup>1</sup>I use ASB, Amsden, and Haggard because they represent the best recent statements of each position, not to personalize the debate or my criticisms.

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in the south, and thus that income disparities necessarily reflect the operation of systematic forces. Amsden (2001, 2003; and see Firebaugh 2003, 2004) by contrast argues that nothing systemic blocks the income convergence she observes. Plausibly, *unit-level causal factors*, like state interests, political coalitions, and policy choices with respect to the acquisition of manufacturing technologies, can always override systemic causal pressures. Finally, Stephan Haggard summarizes the arguments about the causal relationship(s) between different institutional arrangements and development outcomes at the unit-level, as well as making a forthright statement about the need to look beyond institutions to the political and social sources of state power.

Unfortunately, this recent debate offers little advance on or transcendence of the debate as reflected in these authors' own contributions 20 years ago. In 1986, Giovanni Arrighi and Jessica Drangel demonstrated income stratification in the world economy and offered up essentially the same (weakly specified) mechanisms presented in the more current article. Amsden (1979, 1985) had already noted that Taiwan's rapid economic development posed a considerable challenge to dependency theory. Finally, Haggard (1990) presented the essentials, if not details, of the neo-institutionalist argument, arguing that policy choices mattered more than international pressures, that local political coalitions determined the choice of policies, and that local state institutions determined whether policies were effectively executed.

This is not an intrinsically irresolvable debate in which deep methodological differences prevent any resolution while also obviating any need to bridge the gap. The participants share the same foundation: They believe in the acquisition of data through empirical observation; they largely believe that those observations should focus on large scale state and business organizations; they believe that unobservable structural conditions are caused by the aggregate behavior of collective and individual actors; and they believe in falsifiability. Consequently, adjudication is possible.

But asymmetric weaknesses in the participants' positions prevent resolution. Unit-level arguments possess well-specified causal mechanisms, but exhibit three logical weaknesses when they dismiss systemic arguments. System-level arguments treat unit-level arguments in a more logically coherent way, but lack well-specified causal mechanisms. Both sides marshal considerable evidence to back their arguments. Neither remedies its own fundamental flaw. Meanwhile, analyses that jumble unit and systemic level variables cannot determine the relative causal priority of those mechanisms.

Sorting out the relative priority of system and unit-level mechanisms is important. Normal science proceeds by testing alternative hypotheses—well-specified causal mechanisms—against the evidence those hypotheses deem relevant. Hypotheses are tested through controlled comparison of facts, but the asymmetry between system and unit-level arguments makes it difficult to resolve the debate by resort to “fact.” Facts only have standing in reference to some causal mechanism that makes those facts relevant and meaningfully orders them. Because these asymmetric weaknesses center on the absence of precise systemic causal mechanisms, neither side can decisively construct facts in ways that confirm only their mechanism. Systems theories point to facts without being able to *explain* their causal significance; unit-level theories point to facts without being *certain* of their causal significance. The debate cannot be resolved “simply” by reference to facts because each interprets facts like “southern industrialization” differently.

For example, unit-level theories point to the successful use of conditional export subsidies to argue against systemic barriers to industrialization. Conditional subsidies are also associated with relatively autonomous states. Suppose relatively autonomous states were neither a random (non-systemic) outcome, nor an outcome driven solely by local factors. Suppose systemic forces caused an uneven global distribution of economic resources, giving some states a higher probability of having the tax revenues needed to construct a meritocratic bureaucracy capable of administering conditional subsidies. Here, the fact that conditional subsidies correlate with better development outcomes does not invalidate systemic arguments, because relatively autonomous states themselves may be a product of systemic causal forces. As the literature now stands, unit-level theorists cannot show that their favored causal factors do not co-vary with system-level causal mechanisms.

This article has three parts. The first discusses why the dialogue between unit and system-level arguments is barren, focusing on the problems created by the absence of precise system-level mechanisms. The second part offers two similar system-level causal mechanisms that seem to generate many of the outcomes existing system-level arguments predict. These causal mechanisms are certainly neither the only possible ones nor the best, but just presenting precise mechanisms undermines the confidence unit-level theories express that their causal mechanisms do not covary with system-level mechanisms. The third section shows that some unit-level and system causal mechanisms are logically connected, and that many unit-level causal mechanisms might covary with system-level mechanisms. This indirectly remedies the logical flaws in the unit-level arguments, by taking up the challenge to look for, as David Waldner (2004) has put it, the “non-institutional origins of institutions,” and helps answer the question of Haggard (2004, p. 74) about the origins of the “political relationships that create and support [institutions].” The conclusion reiterates the importance of precise systemic arguments to understanding the global distribution of growth, income and economic activity. Unit-level causal mechanisms *alone* cannot explain this distribution, even if they correctly explain part of the evolution of individual cases. Correct explanations matter because they inform the large volume of policy that tries to affect the global distribution of growth and income.

## A Barren Dialogue

Unit-level arguments possess well-specified causal mechanisms, but exhibit three logical weaknesses that taint their argument for the logical priority of unit-level causal mechanisms. System-level arguments are more coherent about why system-level causes are logically prior, but even the best of these only present underdeveloped forms of plausible systemic mechanisms. Because system-level arguments cannot disprove the existence of unit-level causal mechanisms, and offer only weak system-level substitutes, proponents of unit-level causes reasonably prefer to rest explanations on those unit-level causes. Equally so, because proponents of unit-level causes have not made a positive case for the irrelevance of all system-level causes for their critical unit-level variables, proponents of system-level arguments stick to their own causal guns.

## Unit-Level Arguments

Unit-level arguments have three logical deficiencies. First, they commit something akin to the ecological fallacy. Unit-level critics correctly observe that system-level arguments like dependency theory (DT) and world systems theories (WST) lack the kind of precise causal mechanisms that populate unit-level explanations. Yet the absence of precise system-level causal mechanisms in *many* system-level theories does not logically imply that *all* system-level arguments are wrong. The absence of evidence of causal mechanisms in *the most popular* systemic theories is not evidence for the absence of *any* mechanisms in *all* systemic theories.

Second, they generally assume that all systems theories are vulnerable to simple inductive disconfirmation. This is certainly true for system-level arguments stated in absolute, rather than probabilistic terms. A handful of deviant cases credibly falsifies any absolutely stated systemic argument. Thus very early flavors of DT that absolutely denied the possibility of development are disconfirmed by rising per capita income in places like Brazil, not to speak of Korea and Taiwan. This is why more sophisticated versions of DT, like ASB's (2003) argument about global income distribution, make probabilistic statements about system-level aggregates. Probabilistically stated systemic arguments are not vulnerable to simple inductive falsification because the phenomena they predict are system aggregates rather than specific individual attributes. Cases of successful industrialization with rising per capita income would not invalidate systemic arguments (like ASB 2003) that claim that the shape of the total distribution of income or the distribution of the quantity and/or quality of economic activity takes a constant form, even if units change places.

Third, they cannot prove the priority of unit-level causal mechanisms. It is probably true that unit-level mechanisms are correlated with the phenomena they purport to explain. Yet this alone does not logically rule out prior systemic causal mechanisms. Classic unit-level causes—particularly the structure of social classes, the degree and type of state capacity, and the resources available for implementing state policy—might themselves be generated by systemic causal mechanisms. In that case, the positive association of unit-level causes with specific outcomes would confirm rather than disconfirm systemic arguments. This is especially true where one systemic cause was associated with several unit-level causes that in turn were linked to the same development outcome.

Some elaboration helps here. Consider a classic and specific institutional (and thus unit-level) causal mechanism for successful industrialization offered by Amsden (2001): State policies that make access to subsidized loan capital conditional on meeting export targets successfully induce manufacturing firms to export, increasing export earnings and capital accumulation. Assume this is a true causal mechanism explaining export levels. Does this automatically rule out system-level arguments? No. Some system-level causal mechanism might be sorting states (or social classes, or bureaucrats) into four groups: those willing to supply subsidies and able to apply conditionality; those unwilling and unable; and the two mixed cases. In this situation, we could not regard the unit-level causal mechanism as a complete explanation because the unit-level characteristics are themselves dependent on systemic causes (Waldner 2004).

This matters because conditional subsidies might be a sufficient, but not necessary cause for increased export capacity. Other factors conceivably might produce similar export promotion effects, but their causal effectiveness might be a function of system-level causes or constraints that activate them as causal drivers. Suppose all developing countries created export processing zones (EPZs) to promote exports. Then EPZs' causal effectiveness with respect to exports might disappear and a new causal factor might matter; for example, whether EPZs were predominantly staffed with female or male labor. As Seguino (2000) has shown, female EPZ labor permits a kind of disguised devaluation. The availability of female labor, in turn, might reflect patterns of agricultural production set by world demand in the nineteenth century. Thus various systemic parameters obviously change which unit-level characteristics are relevant in the struggle for exports, because it is those systemic parameters that determine what unit-level characteristics matter at a given time. Unit-level characteristics are only *contingently* important, and their importance in any situation is a function of changing systemic causal mechanisms that set the parameters for individual unit's strategic choices and the ability to carry out those choices.

The argument of Amsden (2001) about the causes for “rise of the rest” makes this point without observing what it means about the external validity of her argument. She notes that where nineteenth-century “North Atlantic” late developers could draw on extant stocks of managerial capacity and technological stocks from the second industrial revolution when they developed, in the twentieth century, “the rest” had to build these capacities and absorb these technologies from scratch. To do so, they had to build a “new control mechanism,” specifically conditional export subsidies. Amsden argues that a specific unit-level variable, the “control mechanism,” matters for successful late industrialization—a point we do not dispute. But this mechanism only mattered once the system in which Amsden's unit was immersed shifted away from Depression—and Bretton Woods—era trade and capital controls toward freer trade. This change in systemic parameters is what activated the causal relevance of the new control mechanism.

### System-Level Arguments

Where most unit-level theories have well-elucidated mechanisms, most system-level arguments suffer from a lack of precisely specified causal mechanisms.<sup>2</sup> Although various expositions of DT and WST produced relatively uniform *descriptions* about outcomes, the *mechanisms* producing these outcomes were never clear. Indeed, as Pakenham (1982, p. 136) noted, Fernando Henrique Cardoso denied that he was producing a theory at all; Halperin-Donghi (1982, p. 115) similarly pointed out that for Cardoso, “rather than a ‘theory’... [dependency was] a common feature of a set of

<sup>2</sup> Contrast Valenzuela and Valenzuela's (1978, p. 552) early survey of DT, which concludes, “much work needs to be done...to clarify its concepts and causal relationships,” with the more recent survey by Christopher Chase Dunn and Peter Grimes (1995, p. 395), which states, “Because these theoretical debates are quite recent, there has been little systematic research intended to support or contest the different hypotheses.”

facts that requires explanation.” Nevertheless, virtually all advocates and analysts (see, e.g., Brenner 1977; Valenzuela and Valenzuela 1978; Smith 1979, 1981; Caporaso 1978; Wendt 1987; Chase-Dunn and Grimes 1995) agree that these are system-level theories. Andre Frank’s (1967) description of chains of dependency makes no sense outside the context of a system. Emmanuel (1974) generated the world system arguments that ASB elaborate. The centrality of system-level mechanisms to DT and WST is obscured because both theories were a flag of convenience under which many and diverse arguments sailed, while carrying a jumbled cargo of unit and system-level logics. This jumbled cargo presented a range of implausible economic mechanisms like unequal exchange (Emmanuel 1972), implausible political mechanisms in which external intervention by core countries always attained its preferred goals and plausible, but nevertheless *functionalist* and unmeasurable arguments like those asserting that semi-peripheries “play a key role in promoting the legitimacy and stability of the system” (Arrighi and Drangel 1986: 13).

Consider, for example, arguments that perpetually declining terms of trade keep peripheries poor. The price per unit of output for unprocessed commodities has declined since the mid-1800s, despite considerable volatility. This is true for commodities produced in rich and poor countries because the essence of capitalist competition is a constant search for lower production costs and thus higher profits. If anything, the price per unit of computer memory per unit of time has fallen more steeply than that for wheat, even after agricultural subsidies are subtracted. So the real question is not: Why do prices fall for commodities, but rather why is low-value production largely concentrated in the periphery, regardless of the specific commodity? “Falling terms of trade” does not explain this.

Without a compelling causal mechanism, it is not clear why anyone should accept arguments that system- rather than unit-level causes produce DT’s outcomes. In a near perfect demonstration of the problem here, ASB (2003, p. 6) argue that despite considerable industrialization in what used to be raw materials producing parts of the periphery and semi-periphery, the general shape of the global distribution of income continues to map onto “a stable hierarchy of wealth” consistent with a core-semi-periphery-periphery model of the global economy. They offer two system-level reasons why industrialization has not produced income convergence.

First—echoing Arrighi Emmanuel’s (1974) critique of Bill Warren’s (1980) arguments—ASB (2003) note that the presence of manufacturing in an economy does not guarantee wealth or development. As Amsden (2003) correctly notes, by assuming that all manufacturing is alike, ASB’s statistical analyses naturally discover that manufacturing does not correlate with per capita income levels. If this assumption is wrong, and different categories of manufacturing generate different levels of profit (or surplus) for reinvestment, then we need to explain the uneven and quantitative distribution of manufacturing with some master causal mechanism that distributes manufacturing globally.

ASB invoke the product cycle to explain geographic variations in profit and value added, but this begs the question of why some areas are favored by high value manufacturing in the first place: Why isn’t high- and low-value manufacturing more evenly distributed globally? The product cycle would not *cause* geographical income disparities to emerge in an environment initially characterized by a relatively even distribution of income and production capacities. The product cycle model cannot

*explain* why disparities emerge and exist, only why they might persist. Recognizing this, ASB invoke Joseph Schumpeter's argument about leading sector industries (as does Amsden 2001). Nevertheless, Schumpeter's concept of leading sectors again only describes differences among industries with different profit capacity, without explaining their geographical/international distribution, which is the issue here.

Second, ASB offer a systemic *political* argument: invoking Bourdieu's concept of *illusio*, they claim that rich countries, like rich classes inside countries, systematically change the rules of the game when the poor acquire status symbols and cultural capital once accessible only to the rich. In the face of successful southern industrialization, developed countries changed the development rules in their own favor, away from state-led economic development to the neoliberal Washington Consensus. This argument raises two questions. First, why do rich countries always get their policy choices right? History is full of elites that lost control to lower orders, so why not global elites as well? Second, how do rich countries, or their elites, overcome collective action dilemmas? The collective action problems that elites face at a national level are magnified at the global level. History again suggests no natural ability to cooperate—rich countries not only fight over global market shares (Brenner 1998), but also have sometimes helped subordinate countries rise to enhance their own position in that fight for global market shares. Successful use by some poor countries of rich countries' "permission" for state-led development suggests that rich countries *do* get their policies wrong. ASB essentially see core country elites in the mirror of the *comprador* elites of dependency theory: the former always choose the right development policy; the latter always choose the wrong (less nationally advantageous) one.

If ASB lack a compelling system-level causal mechanism, the explicit critiques offered by Amsden (2003) and Glenn Firebaugh (2003, 2004), as well as the implicit critique in Haggard (2004) all display the logical problems noted above. Amsden (2003) and Firebaugh (2004) dismiss ASB by correlating southern industrialization with rising per capita income in countries with high levels of manufacturing. Amsden (2003) misses ASB's point that individual upward mobility could be consistent with a stable international distribution of income. Firebaugh's (2003) subtle dissection of the international income inequality debate offers only one causal mechanism for declining international (between-country) income inequality: the spread of manufacturing to areas that had remained poor by virtue of manufacturing's absence. He does not explain why manufacturing spread, or why it was once concentrated. Was it systemic- or unit-level causes? This matters because answering "systemic causes" suggests that ASB's argument might be right on its own terms.

The next section advances two system-level causal mechanisms—simple models from economic geography—to help resolve this debate. This is the proper way to start to correct the asymmetric weaknesses in systemic and unit arguments. If it were impossible to generate system-level causal mechanisms, then pointing out the flawed logic behind the sweeping dismissal of systemic arguments is moot. Just so, invalidating unit-level theories is pointless in the absence of a systemic argument with well-specified mechanisms. Since unit-level explanations have very well-developed causal mechanisms, elaborating some system-level mechanisms then allows me to move to the third section, which traces a few connections between unit- and system-level mechanisms.

## System-Level Causal Mechanisms

Before laying out two causal models, it is useful to know what kinds of questions those models are intended to answer. What were DT and other system-level theories trying to explain? DT sought to explain why peripheral economic zones depended on core zones for economic growth. It sought to explain the persistence of relative and absolute poverty in the periphery. And it sought to explain “distortions” both in the structure of economic activity in the periphery and the kinds of economic actors present there. Why was the periphery unable to produce capital goods; why did it rely more heavily on coerced and informal forms of wage labor; and why did it exhibit extreme levels of export and production specialization? An ideal system-level causal mechanism should be able to answer most of these questions.

How a model answers these questions also matters. An ideal system-level mechanism would also have a micro-foundation (an explanation for individual behaviors) that was neither purely voluntaristic nor totally determining. This micro-foundation would explain why actors’ *boundedly rational* behaviors (probabilistically) produced dependency. This would circumvent criticisms leveled at DT, where local elites seem to sell out some notional national interest, and WST, where actors seem to “automatically” know what products and production processes the system assigns to them. Because DT and WST try to explain the historical long run, it would explain the pattern of outcomes for both agriculture and manufacturing since manufactured goods did not constitute the majority of global trade until after the 1950s, and industrial-style manufacturing was not globally pervasive until the 1980s. It would show a structural relationship linking all economies, rather than just having bargaining relationships between otherwise disconnected dyads (Caporaso 1978: 20; Smith 1979: 248, and 1981). Consequently, changes in the core would “condition” changes in the periphery along the line suggested by Dos Santos (1970, pp. 2–31). Similarly, this model would deny dualism in peripheral economies, arguing that development and underdevelopment were two sides of the same process, and that the periphery’s informal economy was intertwined with its formal economy. Dualism could not be remedied simply through “aging” of units progressing through some rigid or organic set of stages (Wallerstein 1974: 388–389). Finally, this mechanism would have to predict the variation in economic structures and income that everyone observes.

Two models from economic geography fit this bill. One is Johan von Thünen’s (1966; original, 1826) agricultural location model, and the other is Paul Krugman’s (1991a, b; Krugman and Venables 1995) model for spatial agglomeration of industrial activity.<sup>3</sup> Thünen explains the uneven distribution of agricultural production on the basis of the interaction of land costs and intensity of production. Krugman explains why manufacturing is distributed unevenly spatially, using the interaction of transportation costs and economies of scale.

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<sup>3</sup> There are other models. Alfred Weber’s (1929; original, 1909) model for industrial location employs a finer grained analysis of transportation costs, labor costs, and market size than Krugman’s. But if Krugman’s model is convincing with respect to the effects of systems-level mechanisms, then Weber’s should be even more so.

The choice of these economic geographies is not accidental. The most popular and durable version of DT, Wallerstein's world systems theory, carried within it the DNA of Thünen's economic geography. Wallerstein relied heavily on the *Annales* school, particularly Fernand Braudel, and the great European agricultural historians like Schlicher van Bath, Peter Kreidte, and Wilhelm Abel. In turn, all these historians drew heavily on Thünen (Dodgshon 1977). As Braudel (1986 v. 3: 38) said about variation in continent-scale economic zones, "It is certainly the case that every world-economy obeys the rules laid down in [Thünen's] book *Der isolierte Staat*." Braudel (1977, pp. 80–83, 89–94, quote at 83) also noted retrospectively of Wallerstein that, "Our points of view are basically identical," with respect to the existence of a dominant city, a set of functionally different zones with different labor practices, and a subordinated periphery. Consequently, I would argue that all I am doing below is making some of DT's causal mechanisms explicit and formal, by tying them back to the formal models that inspired, *inter alia*, Braudel and through him Wallerstein.

### Location, Location, Location

These economic geographies have a simple propositional base that provides precise systemic mechanisms producing DT's predicted outcomes—conditioning of local economies, largely exogenously determined shifts in economic activities, an outward orientation, and pressure on local actors to conform to market signals from abroad. They explain why the normal operation of the market produces a geographically uneven and hierarchical distribution of economic activity and income. This uneven distribution of income and activity in turn is the source of DT's various syndromes or situations of dependence, observed at a national level. We need two location theories—one for agriculture and one for manufacturing—to fully populate DT with economic mechanisms. They can be blended because, as marginalist analyses, they have a common epistemology and ontology. However, precisely because they are marginalist analyses, they do not provide any leverage about *how* markets come into being in the first place. Historically, violence constituted most global markets, but these models are silent on this issue (Schwartz 2000).

Both models assume economically rational, profit-maximizing actors, a homogenous space in which transport costs rise monotonically as you move away from any point in space, and a state that does nothing more than guarantee contract. All of these assumptions can be relaxed without damaging the conclusions that flow from them; all are standard features of economic analysis.

Thünen asks how agricultural activity distributes itself around a single town constituting the largest source of monetized demand. (Krugman makes problematic the number and size of urban manufacturing centers.) Thünen's town provides all manufactured inputs to agriculture; agricultural areas provide all foods and raw materials for the town. He assumes that transportation costs rise monotonically with distance from town and that land fertility is uniformly equal. Marginal urban demand determines the volume of production for all agricultural commodities, while the intersection of urban demand with the combination of production costs and marginal transport costs sets final prices.

Because transportation costs rise monotonically with distance from the town, and because production costs net of rent are the same for everyone, farmers who are

closer to town reap higher profits. They avoid transportation expenses while selling at the same market price as producers farther out. Yet this additional profit is captured as land rents. In a one commodity world, (e.g., wheat) rents will be highest nearest the town, and zero at the point where the last unit of wheat is produced. Moreover, Thünen's model predicts that production technology will shift from capital-intense choices to labor-intense choices at a specific distance from town.

In a two-commodity world (e.g., wheat plus cattle), the crop capable of generating the highest revenue per acre will bid rents up to the point where the lower yielding crop is pushed farther outward. Because land rents are lower farther out (rents fall as transportation costs rise), the lower yielding crop can then begin to make a profit again.<sup>4</sup> In a two-crop world, agricultural production will arrange itself in two concentric rings around the town, with the crop yielding higher revenue per acre closer to town. More crops (or more accurately, more distinct commodities with different revenue yields) mean there will be more rings, each devoted to a specific crop or set of crops. With a fully functioning land market, farmers who invested in the economically "wrong" product for their zone would tend to be bid off the land by savvy farmers growing the higher profit product and able to pay higher rents. Actors, responding rationally to market signals, will create a spatially organized hierarchy of wage levels, skills, and probably wage systems. Rational market behavior thus produces production zones differentiated by commodity and production technique. The Thünen model produces a more variegated (but also more precisely delineated) set of production zones than Wallerstein's core, semi-periphery, and periphery trio. In the late nineteenth century, for example, this hierarchy was visible in Britain's supply zones: Britain for fresh vegetables, Ireland for fresh beef, Denmark and Netherlands for dairy, North America and Russia for grain, Australia and Argentina for wool and canned meats.

In this model, the scale of urban demand determines the market price of food and also the geographic extent of production. If urban demand grows, then each ring will expand as the outermost producer of an inner crop outbids the innermost producer of an outer (lower revenue per acre) crop for access to land relatively close to the city. The reverse would also be true—shrinking urban demand would cause producers to abandon land at the margin in any given ring, and each crop would move inward in search of lower transport costs and higher profits. Again, the outward march of Britain's grain supply zones during the whole nineteenth century from Ireland, to Denmark, Prussia, Russia, and the Americas provides a vivid example. Thünen's simple model provides a systemic mechanism that shows how a spatially differentiated set of economic zones emerges, how the core's economic demand *conditions* peripheral economies (Dos Santos 1970), and why different levels of income and labor control often characterize different zones. As prices change, farmers would expand (or contract) not only the area under cultivation, but also *what* they cultivated and *how* they cultivated it. Empirical confirmations of the reality of Thünen zones at both a local and a global scale abound (for the Atlantic economies, see Schlebecker 1960, Peet 1969, and Grotewold 1971; in Europe, Christaller 1966, Abel 1980 and Braudel 1982; for the USA, Muller 1973; for Japan, Yokeno 1956).

<sup>4</sup> The formula for determining crop location is  $R = Yp - E - Y/K$  or: Rent = (output per acre × price per unit) minus production expenses per acre minus (output per acre × transport costs per unit × distance).

Does this conditioning also imply that development in the town (often) leads simultaneously to underdevelopment in the agricultural periphery as Frank (1967) argued? For a systemic theory, underdevelopment ultimately has to be about differences in labor control practices, returns to labor, and the nature of production processes—that is, *how* something is made—rather than *what* is made because the former ultimately determine differences in income (Emmanuel 1974). If underdevelopment were just about what was produced, then the rise of southern manufacturing would be a decisive blow in favor of unit-level theories.

Thünen's model explains structured variation in *how* commodities are produced and thus explains underdevelopment. All other things being equal, producing higher revenue yielding crops from a given standard unit of land will require relatively more inputs of both capital and labor than would be the case for a crop with a lower revenue yield, and the capital intensity of production also rises. In Thünen's model, production closer to town is associated with steadily rising labor and capital requirements, greater intensity of production (less fallow and more production per unit of land), and more complicated crop rotations. More complicated crop rotations closer to town imply that production is less "monocultural"—more diversified—and also uses more skill and "knowledge" inputs. Increased diversity implies increased demand for labor, and increased complexity implies increased demand for higher quality labor. Both raise wages closer to town, stabilize demand for labor, and suggest that labor relations will be characterized by market rather than physical coercion. So Thünen's geographical core is characterized by diverse production, more capitalization, higher labor uptake, and higher incomes and aggregate demand per unit of land, just like DT's core.

In contrast, Thünen's peripheries face four linked problems that predispose them to underdevelopment: lower wages, less diverse production profiles, a reliance on "exports" to the town (DT's "disarticulation"), and lower levels of capitalization as well as capital intensity. All of these would be felt most strongly in the period when agriculture is predominant, which is most of the period covered by Wallerstein's analyses, a substantial portion of that covered by DT, and the bulk of human history under capitalist markets. First, the total social product available for distribution among landowners, tenants, and laborers in the outermost rings will be small compared to inner (more core-like) rings. Less value is produced per acre, and more acres are left in fallow. Relative to the inner rings, much more area in the outer rings is needed to generate the same amount of gross dollar income. Because nominal wages are lower farther away from town, the lower ratio between peripheral wages and the cost of capital goods sourced from the town would create pressure to substitute labor for capital. Despite this, the lower overall intensity of production implies a low demand for labor *per acre* in production and less potential employment. Lower levels of capitalization and higher levels of monocultural production keep the Smithian division of labor low, implying lower productivity per worker, which in turn also reinforces the tendency to lower incomes. These factors in themselves are not enough to cause peripheralization. They are necessary causes that have to be combined with another sufficient, but *variable* factor, which is the local population density. Areas with low population density—like nineteenth-century Argentina—may end up with high wages. By definition, the most populated places in the world end up being areas with high population density and low labor demand, and thus will have low wages and look like classic peripheries (Lewis 1954).

Why doesn't labor move in response to these wage disparities and eliminate the difference in real wages? Some labor has always moved globally in response to higher wages in the core, but movement sufficient to eliminate the gross disparity in core and periphery wages has never occurred internationally, although a century of movement leveled differences within major core economies (Williamson and O'Rourke 1999). As in Krugman's model, income disparities in Thünen's rest on a relatively reasonable assumption about *limited* labor mobility.

Thünen's model explains much of the peripheralizing consequences that DT asserts follow from participation in the world market. Left to its own devices, the market will sort out production systems along a rent/transportation- and cost-determined gradient, centered on the largest urban market(s). The market forces actors in areas closest to the urban market to produce higher value-added goods, using production processes that apply capital and labor more intensively, so that they can bear higher levels of rent and pay higher wages. Higher wages provide an incentive for employers both in the town and in its proximate districts to substitute capital for labor. The opposite is likely to prevail in the periphery where underdevelopment is a probable but not predetermined outcome of participation in the market. The periphery might escape underdevelopment if the ratio of labor to land were low, or if local struggles over wage levels kept labor in relatively short supply, or if totally free labor mobility at a global level were possible.

## Manufacturing

Thünen's model only explains agriculture. Does southern industrialization imply an end to peripheralization, confirming Amsden (2001) and Firebaugh (2004)? No, because Krugman offers a model for manufacturing "in which there are no inherent [initial] differences among national economies, yet in which an international division of labor can nonetheless spontaneously emerge, and in which some nations fare better under this division than others. That is, we offer a model in which the world economy may organize itself into a core-periphery pattern" (Krugman and Venables 1995: 858).

Krugman's model adds production of manufactured and intermediate goods to Thünen's basic agricultural model, again assuming essentially immobile labor. Manufacturers enjoy economies of scale; agricultural producers cannot. In this model, transportation costs interact with economies of scale to determine whether manufacturers will agglomerate. Assume a totally homogenous world in which manufacturing activity is evenly distributed alongside agriculture (like a peasant economy with dispersed artisanal production). As long as the economies of scale from agglomeration are *lower* than transportation costs, manufacturing remains evenly dispersed, because manufacturers save more money by dispersing production to locations near their markets, than they sacrifice from losing agglomeration economies. Yet if transportation costs decline, manufacturing will agglomerate geographically once the gains from economies of scale become greater than the now lower cost of transportation. By co-locating, manufacturers reduce the transportation costs for the intermediate goods that they consume, while also enjoying economies of scale. The agglomeration of manufacturing causes new manufacturing towns to

emerge, creating purely agricultural regions. Each new firm that joins a given town causes other firms to concentrate production in that town to take advantage of higher demand for its goods. If collocation causes economies of scale to rise enough to fully offset transportation costs even to the most distant market, then all firms end up in one place (Krugman and Venables 1995: 868). The nineteenth-century world economy resembled this, with manufacturing concentrated in two very small zones in northwestern Europe and the northeast United States.

Does this agglomeration of manufacturing and creation of purely agricultural economic zones produce underdevelopment? Krugman and Venables (1995, p. 861) flatly state that “if the manufacturing sector is large enough, this differentiation of roles (agriculture and manufacturing) will be associated with a divergence in real wages as well... [Trade in intermediates] will drive up demand for labor in the industrializing region, while the decline of industry in the other region will lead to falling labor demand.” The market—falling labor demand and lower wages—in turn implies permanently lower aggregate demand in agricultural regions, which both deters manufacturing firms from locating in those regions and implies underdevelopment.

These two models provide precise, if simple, systemic causal mechanisms that generate nearly all the outcomes DT predicts: the market generates a strongly unequal spatial distribution of economic activity and incomes; the nature, scale and pace of economic growth and activity in peripheral agricultural regions is conditioned by changes in core growth and thus demand; the agglomeration of manufacturing raises incomes in the core and lowers them in the periphery, making development and underdevelopment part of the same process. Greater income in core areas would permit the construction of more efficient and sophisticated infrastructures that lowered transaction costs and enhanced aggregate demand, attracting yet more industry (Bunker and Ciccantell 2003). All of these processes would persist so long as the market continued to locate economic activity on the basis of the principles underlying the model.

Note that all of this is generated by *systemic* variables. Both models start by assuming identical units and asking how those units respond to systemically set price levels. We can then introduce unit-level characteristics, like a superior location in terms of transport costs (Krugman 1993), or a particularly effective use of violence to (re)enforce a concentration of industry or to force peasants into production for the market, or, indeed, particularly “good” (i.e., transaction cost reducing) local institutions. All of these unit-level characteristics matter, but their operation only reinforces the models’ dynamics. Dependency-like outcomes would emerge even if every unit possessed “good” institutions because these unit-level institutions would cease to have any causal effect on the distribution of economic activity. Instead, the market would operate even more strongly. Finally, the success of some units in markets is always joined to the relative failure of others, so unit-level characteristics can never totally negate systemic forces.

Thünen’s and Krugman’s models confirm DT’s basic intuitions, but the persistent and pervasive geographic spread of manufacturing in the late twentieth century has diminished the high degree of spatial segregation present in the nineteenth century. Does this mean that system-level arguments apply at best only to the past? The mechanisms in these and other models suggest that manufacturing

should distribute itself into discrete zones based on what is produced and how it is produced, just as agriculture does (Weber 1929 [1909]; Fröbel et al. 1980; and Dicken 1992). Labor costs are like land rents, and fall off with distance from developed areas. This is clearly the case internationally, and a plausible interpretation of what is now emerging inside many larger countries the legislation or collective bargaining practices that once homogenized national wage levels erodes. This urban-rural wage gap will induce manufacturers to relocate production processes with a low intensity of output per worker to regions farther from the global “town.” Krugman’s model provides a systemic causal mechanism for the redistribution of manufacturing activity the product cycle predicts. But it does so without the product cycle’s auxiliary assumptions about state imposed trade barriers that trigger offshore investment by multinational corporations, or even assuming the existence of those MNCs.

Finally, it is noteworthy that the Thünen and Krugman-Venable mechanisms are perfectly consistent with a world economy characterized by ever-increasing global average per capita income, rising levels of manufacturing value added in the periphery, and the emergence of new agglomerations of manufacturing activity. These phenomena do not disturb the underlying gradients of incomes and degrees of valued added in production, or the core-periphery structures predicted in each model. Korean industrial success, for example, does not disconfirm these models so long as all system units do not converge on one income level. Instead, the Krugman and Thünen models allow us to understand how industrialization is consistent with continued peripherality. The next section looks at two examples of the relationship between system and unit-level causal mechanisms.

### **Integrating System and Units: States and the Struggle Over Prices**

The prior section presented two precise models predicting why markets naturally produce dependency and underdevelopment. But do these mechanisms connect to the favored mechanisms of unit-level models? Do system and unit-level mechanisms covary? And how do these systemic economic mechanisms relate to systemic interstate conflict and the emergence of a capitalist system in the first place? This last question has generated a small library of literature. So I will dodge it, aside from noting the centrality of violence, particularly interstate violence, in the origins of markets. Violence is historically central to the emergence of markets, and normatively central in dependency theory. Yet violence does not provide an explanation for how the market might maintain a sorting of regions into different zones afterward. Arguing that violence alone maintains global income differentials opens system-level arguments to the kind of criticism Smith (1979, 1981) proffered: once overt empire is over, once covert empire is difficult, should we not expect a narrowing of income differentials? Interstate conflict does not automatically give rise to the geographical gradients of income and production we can observe, even if state action sometimes negates or exacerbates those gradients. The other two questions are central to our task here: to see if some causal mechanisms central to unit-level theories themselves systematically covary with systemic causes. Two issues seem crucial: the origins

of a competent state bureaucracy, and firms' ability to accumulate capital to fund growth. Put another way: How much do systemic variables determine whether peripheral states can plan, and peripheral firms can grow?

## States

Unit-level causal mechanisms obviously matter when explaining state formation and behavior. Can we link them to economic system-level mechanisms? The Thünen model has an immediate connection to later versions of staples theories (Baldwin 1956; Watkins 1963) that argued for a one-to-one correspondence between export profile and the kind of state that emerged. Wheat exports meant family farms and democracy; sugar meant slave plantations and authoritarianism. In the two models above, a strong prediction of falling production intensity as one moved toward the periphery did not automatically predict poverty. Just so, a specific export good neither automatically dictates how that commodity is produced nor the kinds of social classes that emerge. Nevertheless, two strong probabilistic statements about states emerge from our two purely economic models.

First, states are machines for extracting revenue, monopolizing internal violence, and supplying protection and contract services to a defined territory. *Ceteris paribus*, the greater the per capita revenue base available to a state, the more it will be able to do this job, the better it will be able to do this job, and the more specialized the services it may offer in that territory. Building coherent, loyal, and effective Weberian bureaucracies requires cash for training and salaries. Yet most state formation occurred when agriculture was the predominant form of economic activity, particularly in the periphery. By definition, an area that is incorporated into the market as a Thünen periphery will enjoy less intensive production per acre. This necessarily limits the revenues the state can extract and deploy for the construction of dedicated bureaucracies. Notably, even in unit-level theorists' favorite success cases, like Brazil or Korea, the state had to concentrate its scarce resources into special bureaus, segregate them from the rest of the bureaucracy, and rely on large infusions of external financial and technical assistance to help build those bureaus into Weberian bureaucracies.

Second, again *ceteris paribus*, states with more revenue are more likely to prevail in wars against similarly sized but economically weaker opponents. Therefore, interstate and economic logics are more likely to reinforce each other than not. Peripheries generally will lose wars with core states; by losing wars they remain peripheries. Moreover, the effort to match core state spending levels using a smaller resource base predictably will decrease the volume of resources available for investment (Janos 1989).

Finally, the geographic expansion of a system of capitalist production usually involved the violent creation of new frontier zones. Would-be producers of the extensively produced goods found at the periphery typically acquired both land and labor coercively. Despite the absence of a one-to-one correspondence between what was produced, many peripheral commodities were associated with concentrated landholding and labor repressive production systems. In turn, concentrated land ownership made it unlikely that autonomous states would emerge at the periphery.

System-level mechanisms strongly shaped emergent social classes, as well as the kind of state and its capacities.

### **Firms and Profits**

The second big linkage between system-level and unit-level causes involves struggles over price—for shares of the total social product created by their activities—between core and peripheral firms. This issue is salient because it shows why we cannot examine unit-level variables in isolation from systemic mechanisms. If unit-level behaviors, like state intervention, address structural problems created by system-level mechanisms, then we can only make sense of what these policies (the mechanisms of unit-level theories) are doing by first asking what system-level mechanisms make these policies necessary. Once more, my point is not that unit-level variables lack importance or causal significance, but rather that unit-level variables are brought into play by system-level mechanisms, and so cannot be understood apart from those mechanisms. This issue is best viewed by looking at global commodity chains.

Recall that in the Krugman-Venables analysis falling transportation costs triggered outward movement by firms seeking lower wages when the gains from lower wages exceeded the gains from agglomeration. Obviously, if a firm from the core controls the entire production chain, and owns the chain, profits and income will flow to the core, reinforcing existing income disparities. This phenomenon can easily be understood through the usual product cycle arguments about why firms choose to go multinational (Vernon 1966). Suppose ownership is dispersed. Income would still naturally concentrate in core areas rather than being captured by peripheral firms because of core firms' greater capitalization and greater power in what Weber (Swedberg 1999) called the "struggle over prices."

Most goods are complex bundles of intermediate goods. Firms face "make or buy" decisions at each step in the process of designing, producing, shipping, and selling a good. Each step thus represents a potential site of conflict as firms struggle to secure the best possible price and a bigger share of the value created in a chain (Veblen 1975; Palloix 1977; Williamson 1985; Gereffi and Korzeniewicz 1995; Wallerstein 2000). In this struggle, firms that can use their ability to withhold production from the market (as in Williamson's "hold-up" power, or Veblen's "restriction") are able to push prices upward and extract more profit from a given chain of exchanges. Ideally, they push their profit rate above the average, as Nitzan (1998) and Nitzan and Bichler (2006) have argued in a brilliant updating of Veblen.

Will peripheral firms have hold-up power? The system-level mechanisms elaborated above suggest peripheral production is generally wage sensitive, with low barriers to entry and easy substitutability (Bernard and Ravenhill 1995; Hart-Landsberg and Burkett 1998). As a result, peripheral firms in general will not have hold-up power because core firms in a given chain will be able to find timely substitutes easily. This is most obvious in garment assembly: a vast pool of low-wage female labor in export processing zones is globally available, and low-cost transport makes it possible to bring both capital goods and intermediates to those EPZs cheaply. In contrast, dedicated retail outlets, branding, and knowledge of the end market are harder to acquire. Empirically, industry analyses suggest that in the chains

linking Chinese producers to US markets, for example, Chinese firms capture less than US \$1 of every US \$6 of final sales in the USA.

The Thünen and Krugman models suggest that core firms' advantages in any given chain are self-sustaining, because they are *on average* often able to buy out peripheral firms that acquire hold up power. This is true even if peripheral firms' profit *rate* is higher than core firms' profit rate. Core profit *rates* are not necessarily higher than the periphery's, as low peripheral wages may permit extraordinary exploitation of labor—*vide* contemporary China. Yet because incomes and economic activity are by definition larger in the core of a Thünen or Krugman system, the *volume* of profits in the core is also bigger; the greater capital intensity of core production also means that the volume of assets available for use as collateral is also larger. *Profit volumes* matter more than rates of profit because liquid profit can be used to buy up parts of the production chain that convey the most power in any given exchange. Because core firms have greater profit volumes and greater capitalization in equity markets, they have a trump card in the struggle over price between themselves and peripheral firms. The 100 largest core TNCs had an average market capitalization of US \$62.9 billion in 2000, as compared to the US \$10.1 billion average market capitalization of the 50 largest TNCs from the periphery, most of which were national oil firms (UNCTC 2002: 86–89, 100–102). Of course, some successful and powerful peripheral firms have even bought core firms. Yet, for a systemic argument, all that matters is that *on average*, core firms are more likely to be in a position to buy out threatening peripheral firms in the absence of substantial peripheral state efforts to protect those firms from capture, and to enhance the volume of profit those firms generate. After the 1997 Asian financial crises, foreigners bought 42% of publicly listed firms in South Korea (*Economist* 13 October 2005).

With this in mind, it is clear that the bulk of state policy to which unit-level theorists advert is designed to help peripheral firms reduce the hold-up power core firms possess. Amsden's (2001) argument about the whole range of state policies designed to prevent denationalization, to nurture technical and marketing sophistication in local firms, and to expand control over the entire commodity chain make no sense unless peripheral firms confront systematic difficulties. The policies only make sense—only have causal power and real world efficacy—because of the systemically generated problems peripheral firms face. If the market did not create a geographically structured hierarchy of production, but instead tended to create relative equal units, then it is equally likely that commodity chains would be composed of firms whose degree of hold-up power had no relation to their geographic position. The policies that unit-level theorists study only matter because system-level mechanisms disadvantage peripheral firms in the first place. A system-level analysis explains *why* specific policies work; unit-level analyses explain *which* policies work.

## Conclusions

Most system-level theories about the global distribution of growth, income, and economic activity were underspecified. They provided relatively accurate predictions about global stratification through induction, but underspecification left these theories vulnerable to attacks from critics who could both use specific countervailing

examples and demonstrate the lack of systemic mechanisms. These critics then illogically argued that the absence of specific mechanisms in most systemic arguments was evidence that these mechanisms did not operate in the observed world. They argued that observed variations in economic outcomes and the observed changes in countries' relative economic positions were a consequence of unit-level variables rather than systemic variables. Both arguments talked past each other.

This paper conversely has argued that the old and new economic geography provides simple and plausible mechanisms for the four core claims of most system-level arguments—conditioning of peripheral economies, the inseparability of development and underdevelopment, the persistence of underdevelopment, and core-periphery linkages—and does so for both the agricultural and industrial eras. There is every reason to believe that most services should follow the same patterns—and, just as with manufacturing, white collar services outsourcing typically encompasses undifferentiated, low-value routines such as call centers.

Populating DT and other system-level arguments with specific systemic mechanisms provides a useful *ex ante* understanding of the kinds of units that might populate a global economic system, even if it is imprecise *ex ante* about which specific units will take on which roles. In other words, it provides a better explanation than would be possible only with a unit-based analysis about why—once there is a market—we have a specific international division of labor. These systemic mechanisms allow strong but probabilistic predictions about why some areas receive development and others do not, providing a useful check on optimistic prescriptions for growth, based only on potentially idiosyncratic unit-level comparisons of the sources of variation among units. New economic geography clearly predicts that not everyone can “win” simply by getting “institutions right” or “prices right.” It also clearly predicts that, if everyone got prices right and had good institutions, this would necessarily create an even stronger gradient of economic activity, incomes, and growth, because the market would operate that much more strongly—because the world would resemble the theoretical models more closely.

As Waldner (2004) has convincingly argued, all this matters at a theoretical level—we need to explain not just intra-type variation, but also the origins of types of national and regional economies. If types indeed arose independently, then there would be no need for some systemic theory explaining the origins of types. The belief that states' social bases and bureaucracies are independent of systemic effects occurring at the world market level is akin to belief in the virgin birth. If, instead, the market necessarily produces differentiated types of economies and states via system-level variables, then we clearly need a system-level analysis to understand the causal forces shaping the range of potential outcomes at a unit-level. Otherwise, analyses of units using only unit-level variables will inevitably commit both type I and type II errors. The current predilection in the literature for unit based analysis, and its concurrent dismissal of system-level arguments, necessarily produces incomplete knowledge. If actors at the unit-level are responding to or addressing system-level causal forces, then an explanation based only on unit-level variables will not permit systematic comparison across cases. Actors in different units may be using nominally different behaviors to address similar systemic causal forces that they face; they may likewise generate nominally similar behaviors to address different causal forces. These factors do not dismiss

unit-level analysis out of hand in favor of a systemic analysis. Rather, neither analysis can stand by itself.

It seems reasonable to insist that rather than talking past each other, or jumbling unit and system-level mechanisms together, analysts try to systematically link the two levels of analysis. I have presented system-level marginalist economic models as one effort to start this process. These models are surely too abstract, but this abstraction is not only necessary but also a long-standing tool of social science since Weber. The whole purpose of creating ideal types is to create a baseline against which to assess variation. Variation off these models will be substantial because the mechanisms sketched above are silent on questions of power, particularly the use of violence in the historical origins and maintenance of the markets that do so much work producing a hierarchical, spatial distribution of economic activity in these models. A full system-level explanation resting on the models above clearly needs to be complemented with an investigation of the pre-capitalist origins of asymmetries of state power, and the ways that social conflict play out.

Finally, it is important to note that DT always had a prescriptive component missing from these economic models. This prescriptive component encompassed both policy proposals and a moral architecture justifying those proposals. The policy prescription—withdrawal from world markets—may very well have been wrong, lacking as it did any foundation in a clear analysis of the systemic mechanisms that prescription was intended to address. And the moral architecture? If the mechanisms proposed above not only operate but also operate strongly, then the market will necessarily produce global inequality whatever the nature and quality of local institutions; indeed, it would produce that inequality even faster in a world characterized by uniform, low-transaction cost institutions. A moral stance in favor of global equality or equity was always at the heart of DT. This no doubt made it vulnerable to an illogical dismissal by some people at the same time that it made it compelling to others.

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