

# *The Historical and Global Nature of Dependent Development*

**A Time-Series Analysis of Brazil  
and Mexico, 1901-80\***

---

*Kathleen C. Schwartzman*

**D**espite its historical pedigree, "history" rarely appears as a variable in dependency studies. We do not know from the empirical scholarship, for example, if dependency processes observed in the period prior to the Second World War foretell those of the postwar period; if observations about dependency relations found in the upswing hold for periods of downswing; or if dependency relationships are affected by world-system factors such as the global growth.

Ironically, the empirical scholarship in dependency research appears guilty of the charge leveled against neoclassical economists: it presents what it observes as laws that seem to be eternal and is unable to integrate history into the analysis (Fontvieille, 1991: 234). This is surely a preposterous charge to level against the dependency research agenda which was born of the recognition that 1) the history of developed countries did not reveal the path of underdeveloped ones; and 2) that one could not comprehend the current state of underdevelopment without the recognition of the historical processes which integrated peripheral countries into the global economy.

---

\* This work was supported in part by a Tinker Field Research Grant and a University of Arizona Social and Behavioral Sciences Research Institute Grant. The author would also like to thank Albert Bergesen, William J. Dixon, Samm MacMurdo, Michael Sobel, and Paul Whitley for their suggestions.

Still, there is a place for this charge of neglect which is, in part, the by-product of the division of labor in the research community. Research agendas have traveled two divergent paths: case narratives that maintain loyalty to the historical component, and cross-national research with loyalty to the empirical component. Each makes a unique contribution at the expense of something else. On the one hand, case studies of nations, it has been charged, do not facilitate theoretical refinements of dependency notions (Bradshaw, 1988: 693). The comparative dependency literature, on the other hand, has been less attentive to "history-as-process." I have created a hybrid of the two research agendas with some trepidation. While each of the above-mentioned agendas has its advocates and opponents, this hybrid will satisfy neither: it lacks the large "N" studied by quantitative scholars and it lacks the historical richness favored by case study scholars. Quantitative scholars will want me to "pick-up" a few more countries or additional variables, and case study scholars will want me to tell the story of each year. I think there is a niche for this hybrid work albeit not a large one.

Since its opening salvos in the 1950's, dependency theory has been revised to incorporate historical changes and events. Two major conceptual pillars of the paradigm have undergone substantial reconstruction—1) the most studied dependency mechanism has shifted away from trade to direct foreign investment and indebtedness, and 2) the study of development has been supplemented or replaced by questions of distribution and social inequality. Further, the widening of the debate to include the East Asian Newly Industrializing Countries (NICs) (Gereffi, 1989: 1) and most recently the former Soviet Bloc (Wallerstein, 1991) has led to modifications of the generalizations. The questions posed by these historical events have reinvigorated the dependency debate.

Yet the research which accompanies the reinvigorated debate focuses on Lesser Developed Countries (LDCs) and their dependency ties to core nations and continues to slight the role of the global economy during different historical periods. The comparative dependency scholarship relies principally on data published after the Second World War and thus is incapable of assessing the question of historical continuity. Certainly global economic expansion and contraction must influence the nature of the relationships which unfold among countries occupying different locations in the world-system hierarchy. The study reported here examines economic

growth with a model that incorporates global economic trends and historical periods along with a conventional dependency model. The justification for each of these is discussed below.

### THE GLOBAL FACTOR: AN ALTERNATIVE PERSPECTIVE

The cross-national scholarship on dependency focuses on linkages between LDCs (peripheral and semiperipheral) and the developed countries (core). Such conceptual and empirical framing precludes asking if the changes observed in the growth or industrialization of a given nation are the result of global economic trends. Perhaps it is "world-contextual variables," specifically world-economic growth, which determine the economic development of individual nations (Chase-Dunn et al., 1982: 342). As Bornschier & Chase-Dunn argue, country-level studies contrast with a "world-system perspective in which the world-economy and its dynamics are taken as the starting point" (1985: 4).

A global perspective would hold that domestic economic development is influenced by the global economic development and is sensitive to periods of expansion and contraction. Two schools have specified the nature of the global impact. The first—the development of underdevelopment—argues that increased industrialization of LDCs will take place when the more industrialized countries suffer economic contractions, and inversely, that industrialization will suffer when the industrialized countries do well (the argument popularized by Frank, 1969). Baretta & Markoff make this case for Brazil: they argue that the drop in antiindustrial attitudes (that had been rampant earlier) owed more to the 1930 world crisis than anything else (1986: 447). Events in the world-economy are also identified by Eckstein & Evans,

... World War II provided a crucial stimulus for the growth of local manufacturing industries in the two countries. . . . In short, Mexico and Brazil have been affected by similar international forces and they have responded similarly (1978: 134).

Neither Baretta & Markoff nor Eckstein & Evans champion a general model of economic development; yet they explain two specific historical changes in terms of world-contextual factors. Arguing the more general association as a secular trend in the world-system,

Boli-Bennett (1980) claims that the more industrialized the world becomes, the more difficult it is for any individual nation to industrialize.

The second school—dependent development—argues a positive association between global and national well-being: that LDCs become developed as the more industrialized countries do. How is a positive global effect communicated? A global perspective neither presumes nor precludes a dependency relationship, in fact a “global impact on domestic development” is equally accommodated in “liberal economic” as well as “radical” thought (Walter & Blake, 1992: ch. 2). The global impact could be delivered through a variety of mechanisms, two of which are briefly mentioned. Marx, for one, thought that capitalism would spread in a kind of contagion process (Kay, 1975: 11). The contemporary artillery which “batters down all Chinese walls” could be technological diffusion, or market expansion. Goldstein’s version of this is that “the long-term ups and downs of national economies are not autonomous but synchronous throughout the core. Synchrony spreads to larger and larger regions of the world over the centuries as the core expands” (1988: 4).

The same result could obtain through a dependency mechanism, such as the establishment of export processing platforms by Multi-National Corporations (MNCs) in areas that have low wages as their “comparative advantage.” “As core economies shift toward services, vigorous industrialization becomes the hallmark of the periphery . . .” (Portes & Kincaid, 1989: 491). Owing to this process, Bornschier & Chase-Dunn report that in 1978 about 50% of trade of the developing countries was channeled by transnational corporations (1985: 72). If this globalization is the case, or:

[i]f a new international division of labor is indeed emerging, one would expect LPE [level of processed exports] to be increasing for LDCs as a whole. Such an increase is evident for the 1970’s; . . . 44 of the 73 LDCs in our sample increased from their LPE during the 1970’s, and “mean LPE” increased from 1.58 in 1970 to 1.69 in 1980 (Firebaugh & Bullock, 1986: 341).

In short, Third World “dependent developing countries,” acquire “increasingly diversified industrial capacity” within their borders (Evans, 1979: 9).

Although the underdevelopment and dependent-development schools appear to be contradictory in their predictions regarding the effect of the global economy on LDCs, some reconciliation between these two perspectives is possible if one distinguishes peripheral LDCs from semiperipheral ones. This logic is employed by Baumol: he finds convergence among a club of industrial leaders and centrally-planned economies [*sic*], but a convergence that excludes developing nations (1986: 1079). Regardless of the mechanism and direction of the effect, these perspectives share the notion that the key to understanding national economic growth is found at the aggregate level of the global economy, not simply in one nation's dependent relationships.

Since many have pointed to the fact that "the war [Second World War] was accompanied by an overwhelmingly strong increase in U.S. influence on Latin America" (Thorp, 1992: 187), the paper also examines the cases replacing the core growth rates with those of the United States.

#### HISTORICAL PHASE: AN ALTERNATIVE PERSPECTIVE

The scholarship on development has generally disregarded the question of "historical period." First, the bulk of empirical studies are executed with cross-national data sets. They perforce treat individual country histories as homogeneous, when, in fact, historical processes might well be discontinuous (Isaac & Griffin, 1989). Secondly, availability has confined researchers to data testing the period following the Second World War. Yet, the effects of trade dependency could be period-specific: that is, different causal processes could operate in the prewar and postwar periods. The pre- and postwar periods differ in two crucial ways: first, the prewar period was a time of contested hegemony while the postwar period was one which resolved the hegemonic conflict in favor of the United States. Secondly, the prewar period was one of modest economic growth while the postwar period was one of economic expansion (average rates of change were 2.2846 and 4.3500 respectively).

The prewar period was typified by hegemonic disputes. Even the Brazilian export statistics reflect the competition among Germany, the United Kingdom, and the United States. In 1910 for exam-

ple, Germany purchased 25% and the United States took 37% of Brazilian exports. In that same year, imports into Brazil came from Germany (15.9%), Great Britain (28.5%), and the United States (12.8%). By 1950, those percentages had drifted to 1.7%, 12.3%, and 34.5% respectively, with the United States emerging as the undisputed hegemon. In this undisputed position, it was able to construct the edifice of international economic exchange which reigned during the subsequent years. Included in the edifice were organizations such as General Agreement on Trade and Tariffs (GATT), founded in 1948 and the International Monetary Fund (IMF), founded in 1944. In this liberal period of international trade, institutions like GATT were mandated to acquire reductions in tariffs and maximize growth in world trade. The Bretton Woods international monetary system provided the glue for this edifice by keeping the dollar as the unit of exchange (Maddison, 1982: 137). While Brazil joined GATT in the first year, 1948, Mexico only finally signed the treaty of adhesion in July of 1986 (Castillo, 1986). Mexico had argued against adhesion since 1947 on the grounds that such integration would compromise the autonomy of the Mexican state to plan its own economic development (Castillo, 1986: 10). However, Mexico always had an intense economic trade relationship with the United States, and the issue of adhesion to GATT appears somewhat symbolic. Mexico already was constrained by bilateral or multilateral agreements regarding: basic foodstuffs (sugar, coffee, cacao), and raw materials (cotton, copper, iron, and phosphate); steel, textile, and fibers; and excessive U.S. protectionism against the products of the Mexican agropecuario industry (Castillo, 1986: 20-21).

Despite 40 years of protectionist legislation, Mexico produces few goods which are competitive on the international market. Although it is clear that some of this is owing to the failure of Import Substitution Industrialization (ISI), another obstacle to a developed export program was access to international markets, particularly the United States market (Castillo, 1986: 18). Joining GATT opens these markets. The inference that might be drawn from this discussion is that during the prewar stage, core growth should have more of a positive impact on growth because the dependency ties were more attenuated. In the postwar period, when the United States rises to the undisputed position of hegemon, the dependency ties were multiplied through the mechanisms mentioned above.

In many ways the pre- and postwar periods were qualitatively different. Between 1950 and 1973 "output per man-hour rose at unprecedented rates—more than twice as fast as in the previous eighty years" (Maddison, 1982: 96). "In the 'Golden Age' of the 1950's and the 1960's economic growth in the advanced capitalist countries surpassed virtually all historical records" (Maddison, 1982: 126). Kondratieff called this period an A-phase. It is the moment when the world-economy has a higher percentage of monopolistic sectors which exert an expansionary force on the economy. A-phases are followed by B-phases in which contractions are observed in the existing monopolistic sectors and in capital accumulation rates, due in large part to oversaturated markets (Wallerstein, 1991: 40). Because the postwar period was one of unusual growth and expansion, "results found during this period may be conditioned on certain characteristics of the world-economy . . ." (Bornschiefer et al., 1978: 660).

A plethora of data sets describe the postwar period, however, the exclusive use of postwar data could bias the findings in a number of ways. Conclusions derived from the postwar period (such as those summarized by Rubinson & Holtzman, 1981) could misstate the long-term relationship between trade-dependency and development. In other words, they may be typical of a period of expansion and misspecify the relationship for a period of contraction. Because the pre- and postwar periods are so significantly different, they may require different models of development. The question of historical continuity is examined here with time-series models which periodize the historical sequence into the pre- and postwar periods.

#### EXPLAINING ECONOMIC GROWTH AND INDUSTRIALIZATION

Disagreement over the causes of economic stagnation motivated the original dependency debates. But what is economic growth? In a historical context, the concepts of economic development and economic growth are often used interchangeably. Schumpeter lamented that "historians and economists seem to know well enough what they mean by economic growth or contraction. But this is so only because, in most cases, it is not necessary to be very precise about it" (Clemence, 1951: 227). Growth is often defined in a

narrow sense: "the idea of economic growth denotes an increase in income" (Schultz, 1964: 74); yet implicit in historical and, certainly, in sociological analyses is the notion of transformation. Hirschman implies this: development means the process of change of one type of economy into some more advanced type (1958: 51-52); as does Rostow (1964): stages of growth invoke the notion of increasing diversification of the economy as it moves from a more homogeneous agricultural stage to a more heterogeneous agricultural and industrial stage. Even those who use national income data (GNP/GDP) or growth rates as the dependent variable subscribe to this conceptualization of economic diversification:

A national economy is considered developed if it has high levels of internal differentiation, integration, energy consumption, employs scientific technology in production, and has a high level of productivity in all sectors (Bornschieer et al., 1978: 654).

While growth (or rate of growth) is the variable most frequently used in contemporary studies of dependency to indicate economic growth and transformation (Portes, 1976), it fails to completely capture the sense of diversification. In the study reported here, economic development is operationalized in two ways and the findings are compared.

What determines the level of economic development in a country? While standard economic theories model growth with the basic factors of labor, capital, and land (Looney, 1985: 28); development economists mandate that we model growth with factors such as investment rates, levels of savings, money supplies, and foreign exchange (Zarembka, 1972: 135). Cardoso & Fishlow demonstrate how a neoclassical production function including investment and labor is "markedly inferior to an augmented definition of the production function which includes other variables, reflecting the success of integration into the international economy" (1992: 204). This latter endorsement for an expanded model has been the founding principle in the sociological work on development. On the particular relationship between trade and growth, classical and present-day advocates of "comparative advantage" argue that trade integration into the world-economy maximizes economic development. Dependency theorists argue the opposite, namely that a country's location in, and relationship to, the rest of the global

economy would hinder economic development (Prebisch, 1949; Frank, 1969; Wallerstein, 1974).

Since 1970, a plethora of studies using synchronic cross-national data sets have analyzed the effect of economic dependence on the development of LDCs (Alschuler, 1976; Bornschieer, Chase-Dunn & Rubinson, 1978; Chase-Dunn, 1975; Dixon, 1984; Mahler, 1980; McGowan & Smith, 1978; Rubinson, 1976; Tyler & Wogart, 1973 to name a few).<sup>1</sup> Under colonial rule, the causal link between dependency and obstructed economic development was transparent: it was politically created and maintained. Dependency theorists assert that postcolonial market mechanisms—mediated principally through prices—produce economic outcomes similar to those produced by the political apparatus of the colonial state. While the scholarship has moved away from the more orthodox “underdevelopment” position, it affirms, in many cases, a “dependent development” position, namely, that countries which are more “dependent” on industrialized nations for the direction and velocity of their growth suffer dampened or distorted economic development.

## RESEARCH QUESTION

The questions posed above are incorporated into three models which are then compared. The first model is the simple trade dependency model; the second is an expanded model which incorporates domestic presidential policies; and the third is the global model. Separate models are run for Brazil and Mexico, for the two dependent variables—growth and industrialization, and for the pre- and postwar historical periods. Taken together, the 24 equations offer the basis for answering a number of questions such as: Has the classical dependency effect been attenuated as Evans and others argue? Do domestic policies make a difference (Gereffi, 1989)?

---

<sup>1</sup> The studies vary in period covered and countries sampled. Alschuler (1976) looks at eighteen Latin American countries in 1960 and 1965; Chase-Dunn (1975) looks at from 24 to 46 countries in 1950–55 and 1965; Dixon (1984) looks at 72 developing countries between 1960 and 1980; McGowan & Smith (1978) look at 30 African countries; and Tyler & Wogart (1973) look at 39 developing countries from 1964–66. Bornschieer, Chase-Dunn & Rubinson (1978), McGowan & Smith (1978), Mahler (1980), and Rubinson & Holtzman (1981) all offer extensive surveys of the development literature.

Does the effect of global economic well-being dampen the dependency and domestic policy effects? Does historical period affect the nature of the relationships?

*Model I: A Simple Trade Structure Model*

How does trade affect the economic growth and industrialization of a LDC? Trade structures identified in the literature include: concentration of exports in one unprocessed commodity, balance of trade, and trading partner concentration in exports and imports. Each can have an affect on economic development.

EXPORT PRODUCT CONCENTRATION IN PRIMARY GOODS  
AND DEVELOPMENT

Export commodity concentration in unprocessed goods is typically associated with restrained economic development. If the undifferentiated economy supplies mostly raw materials for the world market, the country is vulnerable to external vacillations of prices, markets, and the like (Chase-Dunn, 1975: 723). Firebaugh & Bullock enumerate the previously cited mechanisms which translate export product concentration into dependent development: long-run decline in terms of trade for unprocessed goods exporters, volatile prices for primary goods, slow growth of unprocessed goods markets, tendency of unprocessed goods to be concentrated in enclaves, and unequal exchanges between LDCs and rich industrial nations (1987: 88).

Firebaugh & Bullock charge that these dynamics cannot be empirically verified; instead they point to "export upgrading" as the mechanism that mediates between product concentration and growth. Forward linkages are crucial to development, "because they set up pressures that lead to creation of new industries" (1987: 92). Rather than promoting technological and infrastructural spin-offs, a high concentration of export products hinders forward linkages and export process upgrading (1987: 97).

In examining the export product concentration effect, Stokes & Jaffee show that an export concentration in goods with low levels of processing has a negative effect on economic growth (1982: 406). Dixon also argues that trade concentration dependence "will have a weak debilitating effect on the rate of economic growth" (1984: 767). This is corroborated by Firebaugh & Bullock who found im-

provements in level of export processing between 1970 and 1980 associated with increases in GNP among LDCs (1986: 341, 347). A negative association between trade dependency and growth is also documented by Alschuler (1976); Chase-Dunn (1975); Gorin (1981); and Tyler & Wogart (1973).

McGowan & Smith (1978), in contrast, looking at African states, found little support for the trade dependency model. Kaufman et al. also claim that commodity concentration has no effect on economic growth (1975: 317). Jaffee joins these authors with his evidence that export dependence has a significant positive effect on economic growth (1985: 114)—although his measure of export dependence describes what most would refer to as simply an “open” economy not a “dependent” one. More recently the argument against the trade dependency thesis has taken the form of asserting its diminished relevance, arguing that, in the postwar period, factors such as direct foreign investment, loans, and aid have a greater “dependency” effect (McGowan & Smith, 1978: 187; Bornschier & Chase-Dunn, 1985: 52).

Summarizing findings (basically of the 1970's) on the question of commodity concentration and economic growth, Rubinson & Holtzman cite zero studies that find positive effects for commodity concentration, three that find no effect (although two of the three are negative but not significant), and five that find negative effects (1981: 93).

#### BALANCE OF TRADE AND DEVELOPMENT

Balance of trade should also have an identifiable impact on economic diversification. While trade surpluses constitute a positive factor in the “comparative advantage” theory, dependency theorists have argued that trade surpluses can produce a negative effect on economic diversification. When prices favor the unprocessed good, trade surpluses result. Such surpluses signal the profit of the agroexport and attract domestic investment to the detriment of alternative economic activities.

Inversely, historical accounts have shown how import product substitution or economic diversification have followed vertiginous drops in world prices which were communicated to the exporting countries through trade deficits. Furtado's account of the growth of Brazil posits that trade deficits—not surpluses—contributed to the diversification of the Brazilian economy. When Furtado looked at the im-

petus to industrial growth in the 1930's, and again between 1949 and 1954, he was struck, in both cases, by the benefits that accrued to industrial investment as the unintended consequence of a fiscal policy to defend coffee profits against falling international coffee prices (1965: 101-04). The 1929 world crisis left Brazil without a market for one-third of its production. Faced with increasing production and declining prices, the government continued its price-defense policy leading to diminished metal reserves (Furtado, 1963: 199-201). Coffee prices remained low during the 1930's. The fiscal solution—devaluation of the Brazilian currency—led to a rise in import prices (Furtado, 1963: 205), which transformed the demand for imported goods into pressure on the internal producers. The depreciated currency of the 1930's "constituted a powerful protectionist barrier for domestic industry which began to operate two or three shifts daily with the aid of small additional investments.... Between 1929 and 1937, while imports declined by 23%, industrial output rose by 50%" (Furtado, 1965: 101). When the sector which produced for the domestic market afforded better investment opportunities than the exporting sector, this led to a shift in the location of capital formation (Furtado, 1963: 216). This historical sequence captures the mechanism (albeit indirect) by which trade deficits can be translated into economic growth.<sup>2</sup>

Despite numerous case studies alluding to the effect that the balance of trade has on economic diversification, this factor rarely appears as a variable in cross-national studies.

#### TRADING PARTNER CONCENTRATION

Trading partner concentration—the heavy reliance on only one country for receiving exports or sending imports—can also hinder development either through the political vulnerability which can accompany such concentration, or through the economic vulnerability which necessarily follows.

---

<sup>2</sup> Several authors have offered parallel accounts regarding the balance of payments (rather than the balance of trade). Evans & Gereffi argue that "pressure on the balance of payments—caused in part by shifts in the international market—was an important impetus for change" (1984: 126). Skidmore suggests that it was attempts to correct deficits in the balance of payments that "provided a powerful stimulus to the creation of domestic productive capacity, both by limiting foreign sources of supply and by channeling the available foreign exchange into purchase of imports essential for industrialization" (1967: 93).

The political vulnerability of trading partner concentration can be seen in the antiindustrial quid pro quos that accompany trading partner concentration. This was exemplified by the 1891 Blaine-Mendonca Trade Treaty between Brazil and the United States, which held that Brazilian coffee and sugar could be imported into the United States with low or no import duties, but: no refined sugar would be imported from Brazil; and Brazil would be encouraged to buy processed goods from the United States. Here, trading partner concentration had the attendant effect of discouraging economic diversification.

When one or few trading partners consume a majority of the exported production, the LDC producer is more vulnerable to market disruptions that occur in the purchasing/consuming country. More generally, trading partner concentration, whether in exports or imports, may impede economic diversification by directly or indirectly allowing extraneous factors to influence a state's decisions about the direction and velocity of growth. In such cases, economic planning is rendered more difficult (Chase-Dunn, 1975: 723).

While historical anecdotes of this process abound, the comparative quantitative literature offers little empirical support for a trading partner effect. In contrast to Rubinson & Holtzman's findings on export product concentration, those on trading partner concentration and growth are ambiguous—two showed positive effects, two showed no effects, and two others, negative effects (1981: 93). Research to date suggests that trading partner concentration does not have a strong independent effect on economic diversification. Research, however, has focused on concentration of "developed" purchasers and not tested concentration of "developed" sellers. Both trading partner concentration effects are tested here.

As indicated in the introduction, many now argue that the dependency effect resides in foreign investment and indebtedness. Although the dependency model can only be partially represented by trade structures, data limitations make the more complete picture of dependency for the entire historical period difficult to achieve.

### *Model II: A Political Process Model*

The quantitative trade dependency scholarship asks about trade structure, but ignores the role that governmental policies play in economic development. Governments transform economic processes

by affecting national endowment factors: investment in human capital, mobilization of natural resources, and increases in capital supply (Jaffee, 1985: 108). Governments are in a position to affect economic growth and diversification by changing the supply and/or demand. In the first case, it is assumed that government investment or the facilitation of investment can change the nature of output. Policies designed to increase investment include: industrial credits, industrial subsidies, a panoply of tax exemptions, and outright government investment. In the second case, it is assumed that the promotion of consumption will lead to increased profits which, in turn, will then have the effect indicated in the first case. Policies directed toward increasing consumption include protecting the domestic market from foreign competition and government purchasing (Maddison, 1982: 129). In general terms, what these policies reflect is the level of state strength (Rubinson, 1976: 649) and its commitment to economic intervention.

Regarding the developmental role of the state, one finds at least two schools of thought. For decades, social scientists have documented how strong (and often authoritarian) states have intervened in the economy to promote industrial development (Gerschenkron, 1962; Gregor, 1979; O'Donnell, 1973). Non-market forces (such as state-sponsored industrialization) can even reverse the traditional global hierarchy of production resulting in industrialization in the periphery (Bornschier & Chase-Dunn, 1985: 72). This was the assumption underlying the ISI development schemes of Latin America in the 1950's and 1960's (Thorp, 1992).

Others assert that the state has no observable impact; rather, it is the extent and nature of foreign trade and investment that shape the process of state building and define the political room that politicians have for maneuvering (Topik, 1987: 2). Cardoso & Fishlow, in their study of eighteen Latin American countries in the postwar period, find that the "sheer size of current purchases of the public sector . . . does not seem to matter" (1992: 205). In their study of Brazil and Mexico, Eckstein & Evans (1978) found no evidence of a political regime impact. Despite variations in governmental policies, and indeed in political regimes (a 1910 social revolution in Mexico, and 1930 and 1964 elite revolutions in Brazil), they found quite a bit of similarity between the two economies. In 1969, for example, both countries had an industrial sector that held 23% of the labor force, and produced 36% of the total output (Eckstein & Evans 1978: 132).

They conclude by dismissing an independent effect of political regime. Evans & Gereffi also conclude that there is no evidence that endogenous political forces are as important in the process of dependent development as external ones (1984: 118).

*Model III: A Global Model*

The third model encompasses trade dependency structures, presidential policies, and adds global well-being. The global factor is justified above in the discussion presented under the section "The Global Factor." It assesses the strength of the trade structures and presidential policies when global economic conditions are added.

## THE RESEARCH DESIGN

*Sample*

Brazil-Mexico comparisons abound—Eckstein & Evans (1978); Gereffi & Evans (1981); Topik (1987)—to name a few. As in any comparative project, one "must make a series of forced choices regarding the number of states . . ." (Hage, 1975: 132). A Brazil-Mexico comparison allows the assumption of equivalence to be reasonably approximated. This comparison offers built-in controls on factors exogenous to the models to be tested such as the colonial and postcolonial experience, geographic region, and location in today's global hierarchy. Brazil and Mexico are industrialized, have relatively strong states capable of promoting and protecting local interests, are rich in resources, have large domestic markets, and are integrated into the global economy through trade, foreign investment, and loans. Gereffi & Evans argue that there is significant convergence between the Brazilian and Mexican models of dependent development; namely, in the denationalization of the local economy, in maintaining dependent relations with international capital, and in considering questions of welfare and equity (1981: 44). To posit that these countries constitute a reasonable pair for comparison in no way constitutes an assertion that they are identical. Indeed the data from the two countries are not pooled; they are run separately to permit comparison and the variables used in the model capture some of these differences.

**Table 1**  
Definition of Variables and Data Source

Variable	Operational Definition	Source
Brazilian GDP 1901-79	Annual percent change in GDP	Abreu, 1990: 388-412
Mexican GDP 1901-79	Annual percent difference in GDP per capita, in 1970 pesos	Nacional Financiera, 1990: 132-33
Brazilian manufacturing 1901-40	Annual percent difference in index of manufacturing volume	Haddad, 1978
1947-80	Annual percent industrial contribution to GDP	UN: 1957; 1958; 1962; 1974; 1980
Mexican manufacturing 1901-70	Annual percent industrial contribution to GDP, in 1960 pesos	Nacional Financiera, 1990: 121-23
Trade balance	Value of domestic goods ex- ported divided by total value of goods imported for domestic consumption	Created from data in Bra- zil, <i>Comercio Exterior do Brasil</i> , and <i>Anuario Estatís- tico de Brasil</i> and Mexico, <i>Anuario Estadístico de los Estados Unidos Mexicanos</i>
Export product concentration	Value of largest export product divided by value of total exports multiplied by 100	" "
Export Partner concentration	Value of exports going to coun- try which receives most exports divided by value of total exports multiplied by 100	" "
Import Partner concentration	Value of imports from country which sends most divided by value of total imports multi- plied by 100	" "
Presidential policy	The presidential score counts the number <sup>1</sup> of pro-industrial policies passed by each president. A score of "1" was given for the creation of each of the following: Industrial banks Government subsidies to industry	

	Government industries Industrial credits Industrial tax exemptions Import restrictions Import taxes Import tariffs	
Core GDP	Annual percentage change in the aggregate GDP of sixteen core countries <sup>2</sup>	Maddison, 1982: 172-73
U.S. GDP	Annual percentage change in the GDP for the United States	Maddison, 1982: 172-73
Foreign Exchange Rates		Annual change in the official <sup>3</sup> quantity of Brazilian Cruzeiros and Mexican pesos equal to one United States dollar.
Population growth	Percent annual change in population size	Brazil, IBGE, 1901-80 Mexico National Financiera, 1990: 132 <sup>4</sup>

<sup>1</sup> The data were taken from historical accounts of each country. Sources for the Brazilian and Mexican codes came from: Abreu, 1990; Baer, 1983; Baklanoff, 1967; Bergsman, 1970; Buescu, 1985; Burns, 1980; Clarence-Smith, 1985; Clements, 1988; Correia, 1980 [1903]; Dubnic, 1968; Dulles, 1970; Dulles, 1978; Dulles, 1980; Baretta, 1986; Fassy, 1987; United Nations, ECLA, 1964; Flynn, 1978; Furtado, 1964; Gomes, 1987; Hayes & Keith, 1976; Leff, 1968; Leff, 1982; Lopez, 1968; Lopez, 1981; Luz, 1975; Mexico, *Diario Oficial*; Morton & Tullock, 1977; Nieto-Lopez, 1986; Poppino, 1968; Reynolds, 1970; Ridings, 1973; Savasini, 1978; Schneider, 1971; Skidmore & Smith, 1984; Skidmore, 1988; Stein, 1957; Vernon, 1963; Wilkie, 1967; Young, 1972; Young, 1982.

This index measures more than level of presidential activity. Testing this for the case of Brazil, I used a list of "entities created" for the purpose of national, sectoral, or regional economic development (Brazil: *A Handbook of Historical Statistics*: 383). I rank ordered the Brazilian presidents in the postwar period according to this list. While both my list and the Handbook's "entities created" list are topped by President Kubitschek, the others were ordered quite differently, that is to say, my pro-industrial presidential policy ranking is not simply a by-product of proliferate presidents. External validation can be gained by comparing narrative accounts with my rankings. "The programs and policies of Mexican government since 1940 have been designed to stimulate private-sector efforts in the development process" (Hansen, 1971: 55). "Camacho, Aleman, Corti and Matero—each of the four has taken economic growth as a prime objective" (Vernon, 1963: 124). The presidential score of these four was 5, 4, 5, and 6 respectively—all above the 1946-79 average score of 3.58.

<sup>2</sup> Maddison takes the country annual change in GDP and then divides the total by sixteen. Maddison argues that by first computing each individually, undue weight is not given to the U.S.A. or other large economies. Maddison took data from Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, U.K., and U.S.A. (Maddison, 1982: 172-73).

<sup>3</sup> The Brazilian data were taken from the following sources: 1) 1901-30—Mitchell (1988: 702-03) who gives cruzeiro-sterling exchange which I in turn converted with sterling-dollar exchanges found in the United States, 1902-30. *Federal Reserve*. 2) 1930-47—Brasil, *Anuario Estatístico de Brasil* (1936: 207; 1940-45; 219; 1946: 254), and 3) 1948-80—Wilkie (1967: 945). The Mexican data were taken from Nacional Financiera (1978: 227-28) and Reich (1984: 74).

<sup>4</sup> In the case of Mexico, it was necessary to use interpolations for years of the Mexican Revolution—1911-21.

*Variables (Table 1)*

## 1. DEPENDENT VARIABLES: ECONOMIC DEVELOPMENT

In this analysis, development is operationalized in two different ways: rates of growth of national income (GDP); and levels of industrial production.

The first, annual percent change in GDP (Produto Interno Bruto) for Brazil and annual percent difference in per capita GDP (Producto Interno Bruto) for Mexico, are the kind of measures that Portes (1976) notes appear most frequently as the dependent variable in dependency research. Data availability forced me to use different measures for Brazil and Mexico.

In the second model, I replace national income with available measures of industrial production. For Brazil, it was necessary to use different measures for the pre- and postwar series. In the prewar series, the annual difference in an index of manufacturing volume is used, while in the postwar series, a preferable statistic was available—the percent of industrial contribution to the GDP. In the Mexican case, annual industrial production is measured with the percent of manufacturing contribution to the total national product.

Why use two different measures of economic development? The more appropriate measure of economic diversification is the most difficult to locate for long cycles. Although users of the “national income” measure of economic development rarely offer an explicit defense, data availability surely counts highly. In addition, the two measures are related. In a cross-sectional analysis of LDCs for years 1958, 1963, 1965, and 1967, Bhagwati & Cheh found that the coefficients of percent of GDP in manufacturing regressed on GDP per capita were positive and significant (1972: 186–87). The R<sup>2</sup> for these models ranged from .111 to .408. Still, the fact that they are related is only a modest defense for the assumption that they measure the same processes. By comparing the results from the two different models, we can judge the suitability of “growth” as a proxy for “industrialization.”

## 2. INDEPENDENT VARIABLES, MODEL I: TRADE STRUCTURES

Four measures are created to describe the international trade processes of Brazil and Mexico: the balance of trade ratio, the per-

cent of exports concentrated in one product, the percent of exports sent to the highest receiver, and the percent of imports coming from the highest sender. While versions of the second and third are commonly employed in dependency studies, the first and fourth are rarely seen.

### 3. INDEPENDENT VARIABLES, MODEL II: PRESIDENTIAL POLICIES

Political systems vary in the locus of agenda setting. The focus on presidential or executive policy-making can be justified empirically and theoretically. During numerous Brazilian presidential tenures, the executive turned the state and municipal posts into mere delegations, e.g., Geisel (Lessa, 1988: 83) and ruled over the legislative and judicial powers, e.g., Vargas, Castelo Branco, and Costa e Silva (Ianni 1971: 7). Mexico also centralized power in the executive (Tardanico, 1986). In practice, even when authority is shared with the parliament, the formation of policy is distinctly president-centered. Weatherford argues that this is always so 1) in the symbolic sense—the president is the “manager of prosperity” and 2) in the concrete sense—the executive plays an important initiating role in the politics of critical economic issues (1988: 116). The variable created for this analysis is president-centered.

The presidential-policy variable is a surrogate for “real” government contribution to economic diversification. Governments, with rare exceptions, express a mandate of modernization and growth, however growth rhetoric is not always concretized in policies. The characterization (coding) of presidents with respect to national economic development is complicated by the extensive repertoire of available policies; the non-unidimensional effect that they may have; and the prospect that governments, by acting simultaneously for economic stabilization and redistribution, could produce contradictory policies. Despite being fraught with obstacles, one must move beyond the narrational account of each president or regime type to some quantitative summary of their policies. The scale has an artisanal nature: it records the number of proindustrial policies. Because this variable makes an experimental appearance, it does not seem appropriate to subject it to additional manipulation such as weighting. It remains artisanal in an attempt to quantify presidential policies.

The policies counted here include import restrictions, import

tariffs, the creation of industrial banks and governmental ministries for industry, industrial credits, tax exemptions, governmental industrial subsidies, and government investments in companies. While the coding encompasses proindustrial policies from both supply and demand sides, it excludes policies which promote: infra-structural projects, direct foreign investment, and currency devaluations. They cannot by themselves be counted as promoting domestic industry because they are responses to a myriad of other economic necessities. One of these, the exchange rate, is included as a control variable.

#### 4. INDEPENDENT VARIABLES, MODEL III: GLOBAL ECONOMIC PROCESSES

Global economic processes are measured with the average year-to-year changes in GDP of sixteen developed countries. The data are taken from Maddison (1982) who constructed a weighted average of per year changes in the GDP for sixteen major industrial countries. This measure captures the major economic movements of the twentieth century such as depressions and wars. It reflects the expansions and contractions of the global economy. The models are also rerun substituting the Maddison measure with the change in GDP for the United States.

#### 5. CONTROL VARIABLE: FOREIGN EXCHANGE RATES

From a purely macroeconomic policy perspective, the main international policy instruments lie in the field of international finance, largely associated with movements in exchange rates. In some cases, currency depreciation may be recommended as a way to restore international competitiveness of a country's exports (Klein, 1985: 128). Or, as was the case of Latin America during the 1950's, attention was given to foreign exchange rather than savings as a determinant of growth (Cardoso & Fishlow, 1992: 200). On one hand, because foreign exchange rates are used to treat a variety of problems (to protect local industry, to increase domestic exports, to improve credit ratings, or qualify for an international loan), and because rates also reflect exogenous factors such as the strengthening of other nations' currencies, they can hardly serve as an indicator for just one factor. On the other hand, because of their salient role, foreign exchange rates (the amount of Brazilian and Mexican currency per U.S. dollar) have been added to the model as control variables.

*The Model*

Three OLS regression models are constructed for each of the two dependent variables during the two historical phases. The models are tested for each country with a time-series regression model which corrects for heteroskedasticity and for first order autocorrelation. Population growth rates are added as a control variable in those models that do not have per capita measures for the dependent variable. The change variables—population growth, foreign exchange, and growth of the core (and of the United States national income)—measure change from  $t-1$  to  $t$ . Following the convention of assessing unaccounted-for-secular-trends, year was also added to the model. Model I is:

$$\begin{aligned} \text{Industrialization (t)} &= (\text{or Growth in national product(t)}) \\ & a + b_1 \log \text{Trade Balance(t)} \\ & + b_2 \text{Export product concentration(t)} \\ & + b_3 \text{Export partner concentration(t)} \\ & + b_4 \text{Import partner concentration(t)} \\ & + b_7 \text{Foreign exchange rate(t-1) - Foreign ex-} \\ & \quad \text{change rate (t)} \\ & + b_8 \text{Population(t-1) - Population (t)/ Popu-} \\ & \quad \text{lation (t-1)} \\ & + b_9 \text{YEAR}^3 \\ & + u_t \end{aligned}$$

where

t = year  
a = intercept  
u<sub>t</sub> = error term

---

<sup>3</sup> It has become standard to include a linear trend variable (year). The justification offered by Korpi is that since "both the [his] dependent and some of the [his] independent variables exhibit increasing trends over time, a linear trend variable will be introduced here to guard against erroneous interpretations of spurious effects" (1989: 318). In the models tested here, however, this linear trend variable (year) exhibits multicollinearity with some of the independent variables. For that reason it was removed from the model along with other variables which exhibited the same. Because the Durban-Watson test for autocorrelation cannot be used when one of the regressors is a lagged endogenous variable, the lagged dependent variable was also removed (Ostrom, 1978: 34).

Model II is:

$$\begin{aligned} \text{Industrialization (t)} = & \text{(or Growth in national product(t))} \\ & a + b1 \log \text{ Trade Balance(t)} \\ & + b2 \text{ Export product concentration(t)} \\ & + b3 \text{ Export partner concentration(t)} \\ & + b4 \text{ Import partner concentration(t)} \\ & + b5 \text{ Presidential policies} \\ & + b7 \text{ Foreign exchange rate(t-1) - Foreign ex-} \\ & \quad \text{change rate (t)} \\ & + b8 \text{ Population (t-1) - Population (t)/ Popu-} \\ & \quad \text{lation (t-1)} \\ & + b9 \text{ YEAR} \\ & + ut \end{aligned}$$

where  $t$  = year  
 $a$  = intercept  
 $ut$  = error term

and Model III is:

$$\begin{aligned} \text{Industrialization (t)} = & \text{(or Growth in national product(t))} \\ & a + b1 \log \text{ Trade Balance(t)} \\ & + b2 \text{ Export product concentration(t)} \\ & + b3 \text{ Export partner concentration(t)} \\ & + b4 \text{ Import partner concentration(t)} \\ & + b5 \text{ Presidential policies} \\ & + b6 \text{ Core GDP(t-1) - Core GDP(t)/ Core/} \\ & \quad \text{GDP (t-1)} \\ & + b7 \text{ Foreign exchange rate(t-1) - Foreign ex-} \\ & \quad \text{change rate (t)} \\ & + b8 \text{ Population(t-1) - Population (t) / Popula-} \\ & \quad \text{tion (t-1)} \\ & + b9 \text{ YEAR} \\ & + ut \end{aligned}$$

where  $t$  = year  
 $a$  = intercept  
 $ut$  = error term

In summary, each of the three models has eight variations: two dependent variables are run for Brazil and Mexico, and each of those is run for the prewar and postwar periods. Multiple variations of the 24 equations were run with alternative lag patterns and with selective

deletions owing to multicollinearity. The convention of running all variables at time "t" was adopted although arguments can be fashioned for variable-specific lags.<sup>4</sup>

## RESULTS OF THE TIME-SERIES ANALYSIS

A cursory glance at levels of industrial development suggests the extent to which Brazil and Mexico have developed over the century. Industry's contribution to the total national product rose in Brazil from 18.79% in 1947 to 27.39% in 1970, and in Mexico, from 11.67% in 1901 to 15.95% in 1945 and, to 23.28% in 1970. Some label this pattern "dependent development" (Cardoso & Faletto, 1979; Evans, 1979) to distinguish those cases from "dependent underdevelopment," and/or they describe this shift as the transition from the periphery to the semiperiphery, a transition that was completed during the mid-1950's (Gereffi & Evans, 1981: 33).

The summary presented here (table 2) highlights those factors which appear significant in the regression models (tables 3 through 6). Looking first at growth, the most frequently used indicator of development, we find that it is positively affected by the global/U.S. economy, and to a lesser extent, by export product concentration in the prewar period (tables 3a and 4a). These findings do not allow us to reject the "staple" or "comparative advantage" theory of growth for the prewar period. What are the determinants of industrial development? Both the global and U.S. economies had a positive impact on industrial growth during the prewar period (for Brazil). In the postwar period (tables 3b and 4b), two trade factors—trade bal-

---

<sup>4</sup> The social processes which transmit the effect of the independent variables to the dependent variables can be grouped into market and non-market processes and their lag times can vary considerably. Market mechanisms are mediated by prices and will produce varied lag times. When the export prices rise, the production for export of the product is likely to rise, and vice versa. For agricultural products, this response could range from a few months (in the case of short growing seasons, animals available for market, or wool already available to shear), to a period of three to four years for a coffee tree to bear commercial crop (Fritsch, 1988: 212), six or seven years for wine, to a longer cycle of nine years (in the case of cork trees). Governments can also encourage exports through export bonuses to producers and/or exporters. Again the lag would depend on the product cycle.

In light of the variations in lag "accounts," and in light of the empirical findings which suggest that altering the lags does not fundamentally change the outcomes, the convention of running the model with variables at time "t" has been adopted.

**Table 2**  
 Summary of Significant Coefficients by  
 Historical Period and Country (a)

	Brazil	Mexico
<b>Prewar</b>		
GROWTH	CORE GDP (+)*	Export Product conc. (+) <sup>@</sup> CORE GDP (+)** U.S. GDP (+)**
INDUSTRY	CORE GDP (+)** U.S. GDP (+)*	
<b>Postwar</b>		
GROWTH	CORE GDP (+)*	
INDUSTRY	Trade Balance (-)** Import Partner conc. (-)** Presidential Policy (-)* Foreign Exchange (-)*	Trade Balance (-)* Export Partner conc. (+) <sup>@</sup> Import Partner conc. (-)** Presidential Policy (-)*

(a) direction and level of association marked as follows:

'+' or '-' to indicate sign of regression coefficient

\* p < .05

\*\* p < .01

\*\*\* p < .001

<sup>@</sup> p < .10 and > .05

Source: Coefficients and standard errors taken from tables 3-6.

**Table 3a**  
**Ordinary Least Squares Coefficients for Regressions of Percentage**  
**Change in Growth on Trade Dependency, Presidential**  
**Policy, and Global/United States Economic**  
**Condition: Brazil, 1902-40**

Independent Variables	A	B	C	D
<b>TRADE DEPENDENCY</b>				
Trade balance	-2.2800 (5.4727)	-2.3512 (5.7784)	-.8123 (5.4694)	-1.6667 (5.6379)
Export Product concentration	.0374 (.0876)	.0378 (.0896)	.0698 (.0850)	.0685 (.0883)
Export Partner concentration	-.1670 (.2460)	-.1644 (.2574)	-.1082 (.2426)	-.1286 (.2500)
Import Partner concentration	.0009 (.1333)	.0021 (.1378)	.0666 (.1322)	.0180 (.1335)
<b>PRESIDENTIAL POLICY</b>				
	-	.0308 (.7204)	-.0079 (.6740)	.0555 (.6924)
<b>WORLD-ECONOMY CORE GDP</b>				
	-	-	-.4829*	- (.2182)
<b>U.S. GDP</b>				
	-	-	-	.2088 (.1372)
<b>POPULATION GROWTH</b>				
	1.5360 (1.6576)	1.5264 (1.6982)	1.2632 (1.6063)	1.6153 (1.6799)
<b>FOREIGN EXCHANGE RATE</b>				
	-85.9426 (64.6590)	-85.7070 (66.0410)	-53.6914 (63.8134)	-64.7568 (66.2237)
<b>YEAR</b>				
	.0468 (.0813)	.0432 (.1175)	.0395 (.1100)	.0435 (.1132)
<b>CONSTANT</b>				
R2	.0892	.0893	.2167	.1420
N	39	39	39	39

\* p &lt; .05

\*\* p &lt; .01

\*\*\* p &lt; .001

@ p &lt; .10 and &gt; .05

a) numbers in parentheses are standard errors

b) omitted due to multicollinearity

c) omitted because dependent variable is per capita

d) results are corrected for heteroskedasticity and autocorrelation

**Table 3b**  
 Ordinary Least Squares Coefficients for Regressions of Percentage  
 Change in Growth on Trade Dependency, Presidential  
 Policy, and Global/United States Economic  
 Condition: Brazil, 1946-80

Independent Variables	A	B	C	D
<b>TRADE DEPENDENCY</b>				
Trade balance	.7536 (3.3389)	-.3423 (3.9770)	-4.4233 (3.9388)	-4.0008 (4.1518)
Export Product concentration	-.02459 (.0546)	-.0081 (.0626)	-.0296 (.0649)	-.0078 (.0733)
Export Partner <sup>b</sup> concentration	-	-	-	-
Import Partner concentration	-.0613 (.0860)	.0738 (.0898)	.0104 (.0930)	.0534 (.1061)
<b>PRESIDENTIAL POLICY</b>				
	-	-.2680 (.4398)	-.3401 (.4108)	-.3888 (.4352)
<b>WORLD-ECONOMY CORE GDP</b>				
	-	-	.5918** (.2940)	-
<b>U.S. GDP</b>				
	-	-	-	.4031 (.2528)
<b>POPULATION GROWTH</b>				
	-1.4647 (2.3080)	-1.6515 (2.4333)	-.6504 (2.6034)	-.7968 (2.8574)
<b>FOREIGN EXCHANGE RATE</b>				
	-.0050 (.0153)	-.0050 (.0158)	.0093 (.0159)	.0078 (.0186)
<b>YEAR<sup>b</sup></b>				
	-	-	-	-
<b>CONSTANT</b>				
R2	.0746	.0754	.1282	.0997
N	35	35	34	33
	* p < .05	** p < .01	*** p < .001	@ p < .10 and > .05

a) numbers in parentheses are standard errors

b) omitted due to multicollinearity

c) omitted because dependent variable is per capita

d) results are corrected for heteroskedasticity and autocorrelation

**Table 4a**  
**Ordinary Least Squares Coefficients for Regressions of**  
**Percentage Change in Growth Per Capita on Trade Dependency,**  
**Presidential Policy, and Global/United States Economic**  
**Condition: Mexico, 1902-40**

Independent Variables	A	B	C	D
<b>TRADE DEPENDENCY</b>				
Trade balance	.8423 (2.3583)	1.7584 (2.5325)	1.0631 (2.1778)	1.2713 (2.0699)
Export Product concentration	.1707 (.1089)	.1968 (.1121)	.1752 (.0957)	.1352 (.0925)
Export Partner concentration	-.1162 (.0977)	-.1317 (.0990)	-.0771 (.0863)	-.0574 (.0831)
Import Partner concentration	.0147 (.0862)	.0215 (.0858)	.0139 (.0730)	-.0430 (.0714)
<b>PRESIDENTIAL POLICY</b>				
	-	.6875 (.7418)	.3548 (.6443)	.3702 (.6112)
<b>WORLD-ECONOMY CORE GDP</b>				
	-	-	.5317** (.1830)	-
<b>U.S. GDP</b>				
	-	-	-	.3788*** (.1085)
<b>POPULATION GROWTH<sup>c</sup></b>				
	-	-	-	-
<b>FOREIGN EXCHANGE RATE</b>				
	-1.0864 (2.5314)	-.3940 (2.628)	1.7616 (2.3929)	2.0774 (2.2854)
<b>YEAR<sup>b</sup></b>				
	-	-	-	-
<b>CONSTANT</b>				
R2	.1003	.1125	.2479	.3068
N	39	39	39	39
* p < .05	** p < .01	*** p < .001	@ p < .10 and > .05	

a) numbers in parentheses are standard errors

b) omitted due to multicollinearity

c) omitted because dependent variable is per capita

d) results are corrected for heteroskedasticity and autocorrelation

**Table 4b**  
 Ordinary Least Squares Coefficients for Regressions of  
 Percentage Change in Growth Per Capita on Trade Dependency,  
 Presidential Policy, and Global/United States Economic  
 Condition: Mexico, 1947-79

Independent Variables	A	B	C	D
<b>TRADE DEPENDENCY</b>				
Trade balance	3.9923 (3.3319)	3.959 (3.4336)	3.8882 (3.8927)	3.5892 (3.9045)
Export Product concentration	.0175 (.0600)	.0162 (.0682)	.0163 (.0696)	.0151 (.0694)
Export Partner concentration	-.0160 (.0731)	-.0145 (.0796)	-.0143 (.0812)	-.0141 (.0809)
Import Partner concentration	-.0891 (.0549)	-.0902 (.0612)	-.0893 (.0654)	-.08331 (.0689)
<b>PRESIDENTIAL POLICY</b>				
	-	.0127 (.2798)	.0139 (.2868)	.0206 (.2873)
<b>WORLD-ECONOMY</b>				
CORE GDP	-	-	.0069 (.1605)	-
U.S. GDP	-	-	-	.0284 (.1252)
<b>POPULATION GROWTH<sup>c</sup></b>				
	-	-	-	-
<b>FOREIGN EXCHANGE RATE</b>				
	-.2982 (.2873)	-.2969 (.2930)	-.2968 (.2986)	-.2980 (.2978)
<b>YEAR<sup>b</sup></b>				
	-	-	-	-
<b>CONSTANT</b>				
R2	.1049	.1054	.1054	.1064
N	34	34	34	34
	* p < .05	** p < .01	*** p < .001	@ p < .10 and > .05

a) numbers in parentheses are standard errors

b) omitted due to multicollinearity

c) omitted because dependent variable is per capita

d) results are corrected for heteroskedasticity and autocorrelation

ance and import partner concentration—have a negative effect. Ironically, presidential policy shows a negative effect on industrial development. One inescapable conclusion that can be drawn from this data set regarding the indicators of growth (tables 3 and 4) and industrial production (tables 5 and 6) is that they cannot be described by the same model.

Turning to the country comparisons, the analysis suggest that Brazil and Mexico (albeit quite different in the nature of their dependency ties) are reasonably well described by the same model. Put differently, despite the fact that Brazil is high on export production concentration and Mexico high on trading partner concentration, the variables which are significant in the models of industrialization and growth are essentially the same. One minor difference is detected in the prewar period: Mexico's growth is positively influenced by growth in the United States and by export product concentration, an influence possibly due to the fact that silver was the number one export during that period (see table 3a, col. D).

Such symmetry as is found in the two-country models is not the case for the two historical periods. The prewar models (see tables 3a and 4a) highlight global economic conditions, whereas the postwar models (see tables 3b and 4b) highlight trade dependency and domestic politics. F tests were calculated where the models were sufficiently identical to permit it and one test in particular stands out. The F test for Mexico's manufacturing growth (see tables 6a and 6b) produced results which were significant (F significant at the .001 level) permit a rejection of the null hypothesis that the pre- and postwar periods are the same. For growth in both Brazil and Mexico, the null hypotheses that the pre- and postwar growth models are the same cannot be rejected. Unfortunately, the F test for Brazilian manufacturing growth cannot be computed because it was necessary to use different data sets for the dependent variables in the two periods. The third conclusion which can be drawn from this data set, then, is that the industrial processes in the pre and post-war periods cannot be described by the same model.

In short, the findings reported in this work indicate three things: that growth—although it frequently is employed as a surrogate for industrialization—does not respond to the same factors that industrialization does; that Brazilian and Mexican growth and manufacturing are described by the same models; and that the pre- and postwar

**Table 5a**  
 Ordinary Least Squares Coefficients for Regressions of  
 Percentage Difference in Index of Manufacturing Volume on  
 Trade Dependency, Presidential Policy, and Global/United States  
 Economic Condition: Brazil, 1902-40

Independent Variables	A	B	C	D
<b>TRADE DEPENDENCY</b>				
Trade balance	1.7022 (3.2569)	2.0906 (3.5081)	2.6910 (2.9949)	2.6351 (3.2805)
Export Product concentration	-.0135 (.0700)	-.0556 (.0621)	-.0498 (.0519)	-.0401 (.0551)
Export Partner concentration	.0932 (.1690)	.0361 (.1645)	.1234 (.1415)	.0485 (.1493)
Import Partner concentration	-.1032 (.0977)	-.1235 (.0898)	-.0853 (.0763)	-.1111 (.0803)
<b>PRESIDENTIAL POLICY</b>				
	-	.5818 (.5104)	.4642 (.4256)	.5295 (.4386)
<b>WORLD-ECONOMY CORE GDP</b>				
	-	-	.4282*** (.1214)	-
<b>U.S. GDP</b>				
	-	-	-	.1906* (.0780)
<b>POPULATION GROWTH</b>				
	-.1094 (.7971)	.2111 (.8630)	.1819 (.7486)	.5238 (.8586)
<b>FOREIGN EXCHANGE RATE</b>				
	42.4174 (33.8824)	16.4022 (36.7096)	29.4619 (31.9401)	12.0052 (35.5141)
<b>YEAR</b>				
	.1268 (.0613)	.0640 (.0822)	.0694 (.0683)	.0825 (.0707)
<b>CONSTANT</b>				
R2	.1015	.2855	.5044	.4134
N	39	39	39	39

\* p &lt; .05

\*\* p &lt; .01

\*\*\* p &lt; .001

@ p &lt; .10 and &gt; .05

a) numbers in parentheses are standard errors

b) omitted due to multicollinearity

c) omitted because dependent variable is per capita

d) results are corrected for heteroskedasticity and autocorrelation

**Table 5b**  
 Ordinary Least Squares Coefficients for Regressions of Percent  
 Industrial Contribution to the GDP on Trade Dependency,  
 Presidential Policy, and Global/United States Economic  
 Condition: Brazil, 1947-80

Independent Variables	A	B	C	D
<b>TRADE DEPENDENCY</b>				
Trade balance	-6.9052** (2.4930)	-12.0844*** (3.4295)	-12.3809** (3.7826)	-11.2838** (3.6773)
Export Product concentration	-.0479 (.0357)	-.0093 (.0379)	-.0101 (.0388)	.0008 (.0394)
Export Partner <sup>b</sup> concentration	-	-	-	-
Import Partner concentration	-.2801*** (.0818)	-.3149*** (.0758)	-.3179*** (.0787)	-.3266*** (.0793)
<b>PRESIDENTIAL POLICY</b>				
	-	-.6189* (.3212)	-.6182* (.3275)	-.6859* (.3327)
<b>WORLD-ECONOMY CORE GDP</b>				
	-	-	.0623 (.2762)	-
U.S. GDP	-	-	-	-.1916 (.2052)
<b>POPULATION GROWTH</b>				
	-.1101 (1.3985)	-.0821 (1.1819)	-.0498 (1.2079)	-.2699 (1.2153)
<b>FOREIGN EXCHANGE RATE</b>				
	-.0265* (.0103)	-.0289** (.0091)	-.0287** (.0094)	-.0290* (.0134)
<b>YEAR<sup>b</sup></b>				
	-	-	-	-
<b>CONSTANT</b>				
R2	.5615	.5935	.5951	.6043
N	33	33	33	32
	* p < .05	** p < .01	*** p < .001	@ p < .10 and > .05

a) numbers in parentheses are standard errors

b) omitted due to multicollinearity

c) omitted because dependent variable is per capita

d) results are corrected for heteroskedasticity and autocorrelation

**Table 6a**  
 Ordinary Least Squares Coefficients for Regressions of Percent  
 Manufacturing of Total GDP on Trade Dependency, Presidential  
 Policy, and Global/United States Economic Condition:  
 Mexico, 1902-40

Independent Variables	A	B	C	D
<b>TRADE DEPENDENCY</b>				
Trade balance	-.2521 (.4279)	-.2652 (.4307)	-.4406 (.4654)	-.2875 (.4404)
Export Product concentration	.0152 (.0288)	.0178 (.0291)	.1248 (.0296)	.1658 (.0297)
Export Partner concentration	-.0147 (.0153)	-.01711 (.0157)	-.0145 (.0159)	-.0153 (.0165)
Import Partner concentration	.0148 (.0151)	.0140 (.0152)	.0097 (.0158)	.1140 (.0167)
<b>PRESIDENTIAL POLICY</b>				
	-	.1148 (.1483)	.1645 (.1568)	.1324 (.1566)
<b>WORLD-ECONOMY CORE GDP</b>				
	-	-	.0347 (.0343)	-
<b>U.S. GDP</b>				
	-	-	-	.7112 (.0174)
<b>POPULATION GROWTH</b>				
	-16.0053 (18.8108)	-23.0364 (20.9667)	-24.187 (21.0668)	-23.9244 (21.3989)
<b>FOREIGN EXCHANGE RATE</b>				
	-.3521 (.3319)	-.2824 (.3458)	-.1030 (.3895)	-.2325 (.3715)
<b>YEAR<sup>b</sup></b>				
	-	-	-	-
<b>CONSTANT</b>				
R2	.5088	.5594	.6085	.6005
N	39	39	39	39
* p < .05	** p < .01	*** p < .001	@ p < .10 and > .05	

a) numbers in parentheses are standard errors

b) omitted due to multicollinearity

c) omitted because dependent variable is per capita

d) results are corrected for heteroskedasticity and autocorrelation

**Table 6b**  
 Ordinary Least Squares Coefficients for Regressions of Percent  
 Manufacturing of total GDP on Trade Dependency, Presidential  
 Policy, and Global/United States Economic Condition:  
 Mexico, 1946-79

Independent Variables	A	B	C	D
<b>TRADE DEPENDENCY</b>				
Trade balance	-2.1018 (1.2872)	-2.0394 <sup>@</sup> (1.1557)	-2.684* (1.1465)	-2.5692 <sup>@</sup> (1.3716)
Export Product concentration	-.0196 (.0471)	-.0049 (.0442)	-.0089 (.0429)	-.0049 (.0450)
Export Partner concentration	.0602* (.0310)	.0453 (.0327)	.0370 (.0323)	.0439 (.0334)
Import Partner concentration	-.2471*** (.0244)	-.2260*** (.0263)	-.2074*** (.0285)	-.2166*** (.0309)
<b>PRESIDENTIAL POLICY</b>				
	-	-.1248* (.0672)	-.1312* (.0629)	-.1217 <sup>@</sup> (.6727)
<b>WORLD ECONOMY</b>				
CORE GDP	-	-	.0618 (.0423)	-
U.S. GDP	-	-	-	.0237 (.3704)
<b>POPULATION GROWTH</b>				
	-117.383 (116.557)	-88.387 (106.671)	-57.898 (103.416)	-58.6490 (116.031)
<b>FOREIGN EXCHANGE RATE</b>				
	.3304 (.2102)	.2852 (.2001)	.2829 (.1902)	.3072 (.2026)
<b>YEAR<sup>b</sup></b>				
	-	-	-	-
<b>CONSTANT</b>				
R2	.9423	.9490	.9538	.9501
N	25	25	25	25
	* p < .05	** p < .01	*** p < .001	@ p < .10 and > .05

a) numbers in parentheses are standard errors

b) omitted due to multicollinearity

c) omitted because dependent variable is per capita

d) results are corrected for heteroskedasticity and autocorrelation

period should not be pooled because they are better described by different models.

## DISCUSSION

These findings raise questions about the Brazilian-Mexican comparison. Do Brazil and Mexico follow similar dependency "paths"? Is there one dependency path (Galtung, 1971), two paths (Dixon, 1984), or alternatively, as Bradshaw claims, multiple paths in that all countries have "unique circumstances that govern the level and type of economic dependency affecting them" (1988: 693)? Galtung claimed there was one dependency path which is the "combined effect" of commodity and partner concentration. Dixon disputed the notion of a combined effect, arguing from his data: "neither the R2 nor the standard error of the estimate exhibits any improvement and hence, these values provide no evidence that the relationship is actually a multiplicative one" (Dixon, 1984: 770). The two cases presented here could be viewed as following different dependency paths to development: path 1—Brazil: a high export concentration in one unprocessed good with a rather low level of trading partner concentration, and path 2—Mexico: a high trading partner concentration in both imports and exports (with the United States) with a rather diverse range of exported goods. They are different, however these differences do not matter much in explaining industrialization and growth.

My comparison of Brazil and Mexico offers no support for identifying any developmental consequences of different dependency paths. In the prewar period, Brazil's industrial development appears to have been sensitive to the global economy in a way that Mexico was not. Despite the aforementioned differences for Brazil and Mexico on the descriptive variables, in the postwar period the growth and industry models mimic each other. According to Gereffi & Evans, such a convergence is promoted both by global economic forces and the penetration of foreign capital into developing economies. Gereffi & Evans suggest that semiperipheral placement entails "increasing convergence in the responses of the Brazilian and Mexican states to the contradictions raised by the predominant role of the TNCs in their economies" (1981: 32). The research reported here, in combination with the studies which show a semipe-

ripheral convergence, do not support the notion of "different" paths.

These findings also address a number of issues regarding development. The answer to the question "What drives economic development?" depends on whether one uses growth or industrialization as a dependent variable: different dependent variables require different models. Those who use growth as a surrogate for industrial development most likely have misspecified the industrial development model and vice versa. The growth and industrialization models are discussed separately below.

Growth of Brazil and Mexico seems to be driven mostly by growth of the core. In both periods, the sole significant factor in explaining Brazilian growth is the rate of growth of the core. In the Mexican case, the rate of growth of the United States must be added for the prewar period, and none of these factors appear significant in the postwar period. The data offer support for a "staple-theory" or "neoclassical theory" of growth which posits that trade with the core nations enhances the wealth of the less developed trading partners. The growth in demand for primary goods in the industrial countries is translated often through price increases (Jacobsen, 1984: 444) into increased exports from the developing countries. This expansion in the core drives the growth of export economies. Although the price-export-growth link must be inferred in the Brazilian case, the Mexican analysis hints that export product concentration has a positive effect on growth in the prewar period.

The industrial model looks very distinct from the growth model. In the prewar period nothing appears significant for Mexico, and the core and U.S. are significant for Brazil. In the postwar period, the model that emerges is friendly to the dependent development model and unfriendly to the neoclassical model. In the postwar model, two trade structures (trade balance and import partner concentration) and presidential policy have negative effects on industrial development.

Since the postwar period in both countries was characterized almost exclusively by trade deficits, the coefficients can be reinterpreted to read: increases in the trade deficit have a positive effect on industrialization, while reductions in the trade deficit have a negative effect. This finding contradicts the conventional neoclassical wisdom which associated trade surpluses with development (and deficits with reduced development). It is certainly reasonable to as-

sume that the long-run necessity of servicing a trade deficit (be it with internal or external capital) will constitute a drain on available capital and such resource transfers, and will deplete savings available for domestic growth. This assumption regarding debt and savings in Latin America is reiterated by Serven & Solimano who show that "the decline (in investment) was larger in the highly indebted countries than in other countries" (1991: 6). In contrast, the data analyzed here support the notion that—in the short-run—trade deficits are associated with higher levels of industrial development. This also is consistent with the idea of "dependent development" because of the necessity that dependent-developing nations have of importing expensive capital goods. Thus trade deficits are associated with industrial production in dependent-developers in the short-run.

In addition, the postwar analyses for Brazil and Mexico lend support to one of the above-made claims regarding trading partner concentration, namely that concentrating the purchase of imports from one partner has a detrimental effect on industrial development. This variable is not common fare in the dependency menu (although it is completely compatible with the logic), but provides corroborating evidence to the general dependent-development position. It suggests that concentrating import-purchases from one seller has a negative effect on industrialization. This may result from numerous intervening processes which are impossible to sort out with this data. The intervening process might be a bilateral trade agreement such as the Blaine-Mendonca treaty. Alternatively the intervening process might be indebtedness. The United States provided loans to Brazil through the Export-Import Bank for the purchase of capital goods which would have had the dual effect of increasing Brazil's import partner concentration, and of increasing its debt to the United States. Clearly this observation of a negative effect of import partner concentration on industrialization suggests the need for more detailed investigation on the dependency effects of trade structure.

The impact of pro-industrial policy, while holding a prominent position in case studies of reasonable short duration, has been excluded from cross-national quantitative analyses. The results obtained here permit a speculation that a pro-industrial presidential orientation matters for development, but not always in a way which agrees with the conventional wisdom on the matter. In both postwar Brazil and

Mexico, the presidential policy variable has a negative effect on industrialization. This finding contradicts the case-study literature which demonstrates a positive effect of pro-industrial policy on industrial development, most markedly during the ISI phase.

How can we account for such a discrepancy? One possibility is of course that the operationalization of public policies is faulty. Let's assume for a moment that it is not the case. In the postwar period, when industrial development was inescapable, industrial policies were often of a protectionist nature. Such policies may have had less "additional" efficacy in an already integrated global economy. Alternatively stated, pro-industrial government intervention seems to have had little effect when economic diversity is driven principally by the global economy. In some of the lagged variations of the models, presidential policy had a positive effect in the prewar period, a finding that fits comfortably with the historical accounts of exceptional pre-Second World War presidents such as Vargas in Brazil and Calles in Mexico. When the model is run for those years that corresponded to ISI development (1935-60), the coefficient for presidential policy is positive and highly significant (1.14 at the .001 with a standard error of .3527). This confirms the opinion of many that ISI policies had a positive effect for a determined period. Rather than supporting the neoclassical rejection of any and all state intervention in promoting development (a summary of this position is offered by Cardoso & Fishlow, 1992: 198-99), my findings suggest that only after the ISI stage was exhausted, presidential policies had a negative effect. Some interpretative caution must be exercised given the "artisanal" nature of my presidential policy code.

In conclusion, Brazilian and Mexican growth are driven by global growth in the prewar period, and industrialization in the postwar period is hindered by both dependency ties and presidential attempts to promote industrialization.

What conclusion do these findings permit regarding the initial assertion regarding historical period? Since the historical process is not a homogeneous one, the debates regarding the various developmental schools—the "stagnationists" (Frank, 1969; Dos Santos, 1970; Marini, 1972; and Baran, 1957, according to Bornschier & Chase-Dunn, 1985: 6) or the "associated-dependent developmentalists" (Cardoso & Falleto, 1979)—have been improperly adjudicated. The results of this time series analysis suggest that a global growth position (call it neoclassical if you insist) can best describe the

prewar period, while dependency developmentalists can best describe the postwar period. Clearly generalizations made about dependency theory based on data from the postwar period do an inadequate job of describing the prewar period and vice versa. How do these results on historical period compare with those from previous research? In the prewar growth model, a discrepancy exists with the "underdevelopment" position which cannot be sustained in this research. In the postwar period, findings contradict those which have found "no dependency effect," and echo those which have found some effect.

How do the findings speak to the global versus domestic debate, or put another way, have researchers neglected an important factor by ignoring the global economy? The data presented here suggest that the state of the global economy had a more salient effect in the earlier stages of "peripheral" development, but that such effect became attenuated in the postwar period. Overall, the findings argue for testing the effects of the global economy in any study of national development.

## CONCLUSIONS

How do the findings presented here speak more generally to the extant literature on development? First, the pleas of Issac & Griffin (1989) against treating history as a homogeneous process need to be heeded. Secondly, we should be cautious in uncritically embracing growth rates as the sole dependent variable. National income and industrial development are not two measures of the same phenomenon. Both growth and industrialization are linked to global growth in the prewar period, yet they are described by different models. It suggests that the use of national income may not always be the efficacious surrogate that its devotees assume. Thirdly, we should incorporate domestic political processes and exogenous global economic conditions more routinely into cross-national models. Fourthly, the traditional trade dependency thesis cannot be categorically rejected. While direct foreign income and debt have certainly attained a primacy in the dependency processes, researchers should be cautious in accepting the often-cited mandate to ignore the study of trade dependency.

## REFERENCES

- Abreu, Marcelo de Paiva, ed. (1990). *A Ordem do progresso: Cem anos de política econômica republicana, 1889-1989*. Rio de Janeiro: Editora Campus.
- Alschuler, Lawrence R. (1976). "Satellization and Stagnation in Latin America," *International Studies Quarterly*, XX, 1, Mar., 39-82.
- Baer, Werner (1983). *The Brazilian Economy, Growth and Development*, 2nd. ed. New York: Praeger.
- Baklanoff, Eric N., ed. (1967). *The Shaping of Modern Brazil*. Baton Rouge: Louisiana State Univ.
- Banco do Brasil S.A. CACEX (1970). *Comercio exterior do Brasil, Exportação*. Rio de Janeiro: Banco do Brasil.
- Baretta, Silvio R. Duncan & Markoff, John (1986). "The Brazilian Revolution of 1930," *Review*, IX, 3, Win., 413-52.
- Baumol, William J. (1986). "Productivity Growth, Convergence, and Welfare: What the Long-Run Data Show," *The American Economic Review*, LXXVI, 5, Dec., 1072-85.
- Bergsman, Joel (1970). *Brazil, Industrialization and Trade Policies*. London: Oxford Univ. Press.
- Bhagwati, Jagdish & Cheh, John (1972). "LDC Exports: A Cross-Sectional Analysis," in L.E. Di Marco, ed., *International Economics and Development*. New York: Academic Press, 181-92.
- Boli-Bennett, John (1980). "Global Integration and the Universal Increase of State Dominance, 1910-1970," in A. Bergesen, ed., *Studies of the Modern World-System*. New York: Academic Press, 77-105.
- Bornschier, Volker & Chase-Dunn, Christopher (1985). *Transnational Corporations and Underdevelopment*. New York: Praeger.
- Bornschier, Volker; Chase-Dunn, Christopher & Rubinson, Richard (1978). "Cross-National Evidence of the Effects of Foreign Investment and Aid on Economic Growth and Inequality," *American Journal of Sociology*, LXXXIV, 3, Nov., 651-83.
- Bradshaw, York W. (1988). "Reassessing Economic Dependency and Uneven Development: The Kenyan Experience," *American Sociological Review*, LIII, 5, Oct., 693-708.
- Brasil. Ministerio da Fazenda (1901-80). *Comércio exterior do Brasil*. Rio de Janeiro: IBGE.
- Brasil. *Anuario estatístico do Brasil (1901-80)*. Rio de Janeiro: IBGE.
- Buescu, Mircea (1985). *Brasil: Problemas econômicas e experiência histórica*. Rio de Janeiro: Forense-Univ.
- Burns, E. Bradford (1980). *A History of Brazil*. New York: Columbia Univ. Press.
- Cardoso, F. H. & Faletto, Enzo (1979). *Dependency and Development in Latin America*. Berkeley: Univ. of California Press.
- Cardoso, Eliana & Fishlow, Albert (1992). "Latin American Economic Development: 1950-1980," *Journal of Latin American Studies*, XXIV, Quincentenary Supplement, 197-218.
- Castillo, Gustavo del. (1986). *Mexico en el GATT*. Tijuana: El Colegio de la Frontera Norte.
- Center for Inter-American Relations (1970). *Brazil*. New York: Center for Inter-American Relations.
- Chase-Dunn, Christopher (1975). "The Effects of International Economic Dependence on Development and Inequality: A Cross-National Study," *American Sociological Review*, XL, 6, Dec., 720-38.
- Chase-Dunn, Christopher; Pallas, Aaron M. & Kentor, Jeffrey (1982). "Old and New Research Designs for Studying the World-System," *Comparative Political Studies*, XV, 3, Sept., 341-56.
- Chase-Dunn, Christopher (1981). "Interstate System and Capitalist World-Economy," *International Studies Quarterly*, XXV, 1, Mar., 19-42.
- Clarence-Smith, Gervase (1985). *The Portuguese Empire 1825-1975*. Manchester, England: Manchester Univ. Press.
- Clemence, Richard V., ed. (1951). *Essays of J. A. Schumpeter*. Cambridge: Addison-Wesley.
- Clements, Benedict J. (1988). *Foreign Trade Strategies Employment, and Income Distribution in Brazil*. New York: Praeger.
- Correia, Serzedelo (1980). *O Problema econômico no Brasil*. Brasilia: Senado Federal & Fundação Casa de Rui Barbosa (orig. 1903).
- Dixon, William J. (1984). "Trade Concentration, Economic Growth, and the Provision of Basic Needs," *Social Science Quarterly*, LXV, 3, Sept., 761-74.

