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The relationship between the international and domestic structures of the political economy of Britain, France, and Japan; and relative changes in their international trade

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THE RELATIONSHIP BETWEEN THE INTERNATIONAL AND DOMESTIC STRUCTURES OF THE POLITICAL ECONOMY OF BRITAIN, FRANCE, AND JAPAN; AND RELATIVE CHANGES IN THEIR INTERNATIONAL TRADE

A Thesis

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For Susan, Andrew, James, and William

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ABSTRACT

Peet, Curtis Edwin. Ph.D., Purdue University, August 1993. The Relationship Between the International and Domestic Structures of the Political Economy of Britain, France, and Japan; and Relative Changes in Their International Trade. Major Professor: Dr. Keith Shimko.

Many scholars have claimed that the overwhelming relative economic and military power of the United States from 1945 to the early 1970s distinguished it as a hegemon, and was directly responsible for the growth of world trade. The relative decline in U.S hegemony since the early 1970s led some scholars to predict a reduction in world trade. However, empirical tests of this theory have produced mixed results, leading to the conclusion that although U.S. hegemony is an important factor affecting world trade, there must be other equally or more important factors.

This study improves on the emphasis of U.S. hegemony by integrating this systems level approach with factors relative to the international and domestic political economy of particular states. Three factors are examined affecting relative changes in the international trade of Britain, France, and Japan, from 1950 to 1989. These three factors are: U.S. economic hegemony; Britain, France, and Japan's relative international economic power; and Britain, France and Japan's, domestic regulatory capacity. These three factors are operationalized and employed as independent variables in an econometric time-series regression in which the relative trade of each country functions as the dependent variable.

The results show that when the three countries are pooled, all three factors are highly significant. However, when each country is examined separately, different combinations of these three factors are significant. For Britain, U.S. economic hegemony and Britain's relative international economic power were the most important factors. For France, domestic regulatory capacity was most important. While Japan revealed that its relative international economic power and domestic regulatory capacity were the only significant factors accounting for changes in Japan's relative trade. These results show that the three factors used in this study supply a much fuller accounting for changes in the relative trade of Britain, France, and Japan than measures of U.S. hegemony alone. Furthermore, the results reveal a diversity among these three states concerning the most significant factors affecting changes in their relative trade. This study extends existing research on international trade by integrating international and domestic political factors at both the international an state levels in order to account for changes in international trade.

CHAPTER ONE:

INTRODUCTION AND LITERATURE REVIEW

Introduction

Since the end of World War II, scholars have proposed many theories concerning the conditions which augment or diminish international trade. Much emphasis has been placed on causal factors at the level of the international system. In other words, it is often assumed that the primary determinant of international trade rests in the structure of the international system (e.g., hegemonic, capitalistic, bipolar, etc.). Additionally, some scholars have claimed that the most influential factor affecting the international trade of a particular state is the state's location within the international structure. More specifically, a particular state's international trade is believed to be a function of the nature of its relationship with its trading partners. Therefore, a state's power or capabilities relative to other states will lead it to promote, resist, or exploit commercial exchange with its trading partners. Finally, some scholars believe that domestic factors have the strongest influence on a state's international trade. In this manner, domestic political and economic factors are assumed to be the primary determinant of a state's international trade.

Until recently, scholars conducted their research within the confines of one of these three approaches, believing that a single level of analysis provided a discrete

and elegant causal explanation for the behavior of international trade. Today, a debate is underway which delineates the limitation of such an approach and calls for an integration of international systems, relative state capabilities, and domestic factors to account for international political and economic phenomena. With respect to international trade, such an approach would assume that international trade is not simply a function of a single factor from one of these levels, but results from a combination of factors stemming from each of these levels.

Although such an approach would most likely offer a more complete account of changes in international trade, it is also fraught by numerous difficulties. Since this type of research is still in its infancy, the main difficulties stem from the relatively small amount of theoretical and empirical work of this type that can be used as a foundation for additional research. Nevertheless, this study contributes to this emerging line of research by employing variables from the level of the international system, relative state capabilities, and domestic political economy in order to account for changes in international trade.

This study presents a linear time-series regression model for which independent variables are selected from each of the three levels of analysis presented above, and the dependent variable is constructed in a manner that measures real changes in international trade. This model is used to examine Britain, France, and Japan from 1950 to 1989. These three countries are examined as a pool, in addition to being examined separately. Constructed in this manner, the central problem addressed by this study concerns whether or not employing a combination of variables from the levels of the international system, relative state

capabilities, and domestic political economy can significantly account for relative changes in the international trade of Britain, France, and Japan. An affirmation of this procedure would provide an improvement over research that employs only one level of analysis to account for changes in international trade. Significant findings from this integrated approach would both enrich the current development of theory while also suggesting more complex models and paths for additional empirical research.

Literature Review

For the purposes of this study, the literature review can be divided into three sections. Each section discusses the central literature relevant to the international system, the state within the international system, and the domestic political economy of states respectively.

The International System

Most of the literature written in recent years attributing an explanatory role to the international system can be loosely divided into two camps. The first camp is exemplified by the work of Immanuel Wallerstein (1979). Wallerstein holds that the international system functions as it does because the capitalist mode of production has encompassed the globe. The needs of this perpetual capitalist system require that states are structured within the system in a manner that satisfies the capital and labor requirements of the capitalist system. This structure is described as a core, semi-periphery, and periphery.

The second camp can be characterized by the work of Kenneth Waltz (1979). Waltz claims that the nature of the international system is one of anarchy. Within such an environment, states are concerned primarily with providing their own security. The degree to which they are successful at meeting this objective is a function of their relative capabilities (power). Given Waltz's emphasis on security and relative state power, this theory shares important features with political realism. Because the interaction of these features delineates the structure of the international system, this approach is commonly referred to as structural (or neo-) realism.

Both of these theoretical approaches to the international system invite intriguing research questions. However, in this study the theoretical and empirical work focusing on the international system fits best within the theoretical framework of structural realism. However, as will later become clear, this study will move beyond the limitations of structural realism by including other levels of analysis. Nevertheless, the part of this study that employs a systems level analysis shares many of the assumptions of structural realism.

Other scholars have extended this theoretical approach by claiming that a peculiar type of international structure exists when one of the states within the system acquires capabilities which are so superior to the other states that the powerful state assumes the status of a hegemon. Within a hegemonic international system the behavior of all other states is a function of the demands made by the hegemon. It is further assumed that a hegemon, once secure in its favored position, will impose an open trading regime on the international system which will result in higher levels of international trade than would have existed within a non-hegemonic

international system. As long as the hegemon can remain dominant, the international system will be open and stable. Therefore, this particular brand of structural realist theory is often called hegemonic stability theory (Krasner 1976).

Since it was first formulated, hegemonic stability theory has assumed two versions, one focusing on economic explanations and the other focusing on political explanations. The economic version of hegemonic stability theory claims that a liberal international economic order is in the best interest of both the hegemon and other participating states because the liberal system provides a collective good which allows all participants to enjoy absolute gains such as economic growth, higher levels of satisfaction, etc. However, because of the temptation for non-hegemonic states to exploit this collective good, if the hegemon is not willing and able to stabilize the liberal economic system, continued exploitation by the non-hegemonic states will result in a decline in international trade (Kindleberger 1973; 1981).

The political version of hegemonic stability theory emphasizes the overriding concern of national security. Whereas the economic version claims that states are motivated to follow the lead of the reigning hegemon because of the absolute gains that they receive, the political version claims that states are more concerned with relative gains vis-a-vis other states. The gains made by states participating in international trade are also the most important source of state power. Although all states may gain from international trade, the gains are distributed unevenly. This causes some states to become more powerful relative to other states and results in the demise of the hegemon and the eventual collapse of the liberal world order (Gilpin 1981).

In spite of the elegance of hegemonic stability theory, its validity has been called into question by a number of empirical studies. For example, Timothy J. McKeown (1983) claims that during the period of nineteenth century British hegemony, changes in tariff levels are better explained by changes in the political business cycle rather than changes in British hegemony. In the twentieth century, changes in U.S. hegemony can give a partial account for changes in trade regimes that would affect levels of international trade, however, a fuller account is produced when changes in U.S. hegemony are employed along with changes in the surplus capacity of production (Cowhey and Long 1983). Furthermore, it has been argued that a hegemon cannot by itself create and maintain an open trading regime. There must also be states which are willing to follow the hegemon's lead (Stein 1984). In other words, international trade rises and declines because other states are willing to commit themselves to bilateral tariff reductions with the hegemon.

In the late 1980s Michael Webb and Stephen Krasner (1989) conducted an empirical assessment of hegemonic stability theory. Working from the assumption that sustained U.S. hegemony was necessary to promote the growth of international trade, Webb and Krasner first examined trends in various aggregate measures of U.S. power over time and then compared these trends to trends in international trade. Concerning trends in U.S. power, Webb and Krasner claimed that the U.S. has experienced relative decline from 1950 to 1970 in such areas as the aggregate size of the economy, per capita income, growth rates, shares of international investment, and shares of world monetary reserves. However, these indicators have

stabilized since 1970. The exception to this trend is the United States' share of world trade which has steadily declined since 1950 to the present.

Concerning the continued growth of the international trade, Webb and Krasner examined trends in international investment, capital movements, and international trade. They found that although these had been disturbed by the failure of the Bretton Woods monetary system and the oil shocks of the 1970s, they had by no means collapsed. Since 1950, international investments and capital movements have demonstrated impressive growth and show no signs of slowing down. Additionally, the growth in international trade has increased at a faster rate than the output of the major developed countries. In light of these trends, Webb and Krasner have concluded:

> . . . if the hegemonic stability thesis is understood to mean that stability is only possible if there is a hegemonic power and that the United States is no longer a hegemon, then recent empirical developments are not consistent with the theory. Despite setbacks and difficulties, the world economy has performed too well, and remained too open (1989, 195).

The continued growth of international trade has raised the curiosity of numerous scholars. However, their explanations vary as much as their approaches. Robert Gilpin (1987) believes that the United States has lost its ability to preserve international trade. The prolonged growth of international trade is propelled by inertia which once spent will leave the international economic system to devolve into a mixture of mercantilistic competition, economic regionalism, and sectoral protectionism.

In contrast to this analysis, and based on a different operational definition of hegemony, some scholars claim that the U.S. is still a hegemon. For example, Bruce Russett (1985) argues that the most important determinant of hegemony is not a nation's superior power base, but the extent to which it can control outcomes through its maintenance of the existing regime structure. In other words, the continued growth of world trade does not result from the United States compelling other states to practice trade, but stems from supporting liberal trade regimes which produce outcomes favorable to the interests of the United States. In a similar vein, Susan Strange (1987) has argued that true hegemonic power is structural power over the international supply of money and credit. As long as a hegemon can ensure that money and credit are plentiful, the other countries will be encouraged to purchase foreign products. In this light, disturbances in international trade would not be the result of a hegemon's inability to impose trade upon others, but from its failure to provide sufficient money and credit to the international system (Strange 1985).

A global culture consistent with the interests of a hegemonic power is another way of bolstering a hegemon's dominant position and reinforce regimes which promote the continued growth of international trade. Robert Cox (1981, 1987) and Stephen Gill (1986, 1989) are representative of scholars who conceptualize hegemony from a Gramcian perspective. They claim that hegemony is best understood as the culture assimilation of values and norms which legitimize and enhance the privileged position of the reigning hegemonic power. In this manner, the hegemon does not impose global order by force or coercion, but by securing the consent of the ruled. Although this type of analysis raises many interesting

questions, even within the context of political realism (see Russett 1985, 228-232), it is somewhat removed from political realism and thus strays from the theoretical focus of this study.

In reaction to evidence that the United States was loosing its ability to function as a world leader, some scholars have shown how international trade and other forms of cooperation might continue in spite of hegemonic decline. According to this argument international regimes would be the intervening variable which connected state interests with international trade. International regimes have often been defined as "principles, norms, rules, and decision-making procedures around which actor expectations converge in a given issue-area" (Krasner 1982, 1).

Robert Keohane (1984) has clearly presented an account of the possibility for continued international trade and other forms of cooperation, even "after hegemony". For Keohane, cooperation is not the same as harmony and therefore does not happen automatically. Cooperation must be created through a negotiating process (1984, 51). International order must be created by a hegemon, and because regimes constitute elements of an international order, they too must be created by a hegemonic power. However, once regimes are created they change the international context such that egoistic states may choose to continue cooperation without an enforcer. Regimes accomplish this result in two ways. First, by reducing transaction costs and uncertainty states are positively motivated by regimes because of reduced risk. Second, states are negatively motivated by regimes to cooperate because defection would not only result in a loss of reputation, but would also

initiate retaliation by other states (Keohane 1984, 100-109). In short, regimes make cooperation through international trade the rational choice among egoists.

This literature review has summarized some of the major arguments which focus on the relationship between hegemony and international trade. Although the literature used concepts of British and U.S. hegemony to account for different characteristics of the international system such as liberalization, openness, or regimes, they all examined international trade as a means of measuring changes in these characteristics. However, employing concepts of hegemony to account for changes in trade patterns or levels within the international system is plagued by two problems which are addressed in this study. First, hegemonic stability theory has received only partial empirical support. Although several arguments have been put forth in order to account for the short-comings of hegemonic stability theory, they are all inconclusive at best. Clearly, hegemony offers only a partial explanation for changes in international trade. Additional factors even more significant than hegemony may also play an important explanatory role.

Second, hegemonic stability theory has the same limitation found in all international systems level theories in that it cannot account for the international trade of individual countries. In other words, although it offers some explanation for systems level changes in international trade, it cannot explain the differing levels of trade among other states within the international system. In order to do this, it is necessary to examine characteristics of the states which compose the international system.

The State Within the System

Although classic arguments for free trade, such as those proposed by Adam Smith ([1776] 1965) and David Ricardo ([1817] 1948) are often praised for their elegance, in reality, the practice of free trade is not in the best political interest of all countries. Although this point was popular among seventeenth century mercantilists such as Thomas Mun ([1664] 1949), more sophisticated arguments from the likes of Alexander Hamilton ([1791] 1964) and Frederick List ([1885] 1966) have argued that trade must be regulated in order to protect infant industries and break free from the dominance imposed by the strongest commercial countries.

More contemporary scholars have expanded this thesis claiming that a state's reluctance or eagerness to engage in international trade is a function of a state's power relative to other states in the international system Although the concept of power is often diverse among these accounts, for the most part they agree that in addition to the type of existing international system (e.g., hegemonic), the degree to which a state engages in international trade will be partially determined by a state's relative power within the system.

Stephen D. Krasner (1976) claims that a state's preference concerning international trade will be a function of its economic power relative to other states. Krasner's argument is couched within the context of hegemonic stability theory. In short, states that are relatively large, economically efficient, and at the forefront of technology, will prefer an open trading regime. This would allow the state to engage in increasingly greater amounts of trade, thereby enhancing its economic strength relative to weaker states.

Recently, David Lake (1988) has constructed and tested a model for determining a state's preference order concerning international trade, given the state's location within the international hierarchical structure. Lake claims that "the international economic structure and the position of nation-states within it create constraints and opportunities that shape the trade strategies of countries in important and predictable ways" (1988, 30). Although Lake is attempting to explain trade strategies in his work, it is plausible to assume that rises and declines in a states levels of international trade will follow, at least somewhat, the strategies adopted by these states. Therefore, in addition to accounting for U.S. trade strategies from 1887-1939, Lake also shows that during this time of presumed British hegemony, it was often the case that a country's involvement in international trade increased relative to other countries as its production efficiency increased relative to other countries. Although a more detailed account of the theoretical implications of this finding are reserved for the next chapter of this study, to this point the literature review has shown that in addition to the explanatory role given to hegemony, a state's international trade is affected by the economic power that the state exercises relative to other states in the international system.

The Domestic Political Economy

The previous two sections of the literature review share a common deficiency. In focusing only on a hegemonic international system or the relative economic power between states, domestic political factors are intentionally neglected. It is often assumed that international and domestic politics operate in mutually exclusive

arenas. Thus, "black boxing" the domestic political economy should only simplify and clarify explanations for international phenomena. However, such a perspective requires the unrealistic assumption that international and domestic factors are not significantly related to one another. Besides the fact that such an assumption seems intuitively invalid, an extensive body of literature exists which theoretically and empirically show a relationship between factors in the domestic political economy and aspects of international trade.

Most of the research within this group uses domestic politics to account for changes in trade policy rather than the actual rise or decline in trade. Characteristic of this are the early explanations which focused on the influential pressure of interest groups on the legislative process (Schattschneider 1935). It was argued that trade restrictions would benefit a small number of economic elites at the expense of the welfare of the rest of society. However, because of their small numbers and high degree of organization, these groups could apply pressure on an easily penetrable congress, thus successfully steering policy in their favor. In a related vein, it has been argued that the 1970s were less protectionist than the 1920s because the primary control over trade policy had shifted from congress to the president thus making it more difficult for interest groups to exercise their influence (Pastor 1980).

Some scholars have looked to political parties as the best explanation for trade policy preferences. For example, it has been argued that the Republican party has found its strongest support in the industrial northeast and midwest, leading it to favor protection against import competition. On the other hand, the Democratic

party has been dominant in the agricultural south, thus leading it to favor free trade. Therefore, trade policy is perceived as a function of which political party is in power (Terrill 1973).

The vagaries of international economics is also offered as an explanation for changes is the openness of world trade. Slow growth and surplus capacity result from the inherent swings of the business cycle. When producers are confronted with unsold inventory they pressure government for protection against competing imports so that their remaining stock can be absorbed by the domestic market (Strange 1979). The decline in trade results in a global economic depression and instability, thereby exacerbating protectionist pressures on all states (McKeown 1984).

John G. Ruggie (1982) has argued that a state's economic policy preference is directly a function of its social purpose. The post-war Bretton Woods monetary system established what Ruggie has called "the compromise of embedded liberalism" (1982, 393). Thus, under U.S. leadership, monetary and trade regimes were created which allowed states to experience growth through multilateral international trade while still protecting the domestic welfare of their societies. In this manner, liberalism became an embedded feature in the contemporary international economy.

In the post-World War II era, U.S. hegemony has characterized the particular structure of the international system. Additionally, the United States, Western Europe, and Japan have shared the same social purpose of multilateral trade and domestic stability. They have also shared similar views for securing the dichotomous goals of free trade and domestic welfare. On the international level they supported and participated in international regimes as a way of governing the growth of trade.

On the domestic level, they all practiced Keynesian demand management in order to maximize employment and prevent the boom and bust characteristic of an unregulated economy. Peter J. Katzenstein (1985, 54) has observed a relationship between the international trade of small European states and the level of government transfer payments made to households. In order to stimulate the economic growth needed to support the domestic payments, government must encourage international trade. Thus, Katzenstein's work reveals a relationship between domestic social spending and international trade.

In Summary, the literature that discusses the relationship between the domestic political economy and international trade covers a variety of approaches. The research from Ruggie and Katzenstein is especially interesting because Ruggie takes into account the role of U.S. hegemony, and Katzenstein considers the relative size and/or power of states. In spite of the exstensive scope of the research literature, currently there is no systematic attempt to explain changes in the international trade of particular states as a function of changes in U.S. hegemony, the relative economic power of particular states within the international system, and the domestic political economy of states. In order to conduct such a test, it is first necessary to place this research problem within a theoretical context.

CHAPTER TWO:

THEORY AND RESEARCH DESIGN

Theory

In a recent article, Romen Palen has discussed an emerging approach to international relations research which he described as the "second structuralist theories of international relations" (Palen 1992). Characteristic of this approach is the researcher's desire to correct the shallowness of one-dimensional systems-level theory. Rather than theorizing a homogenous international system, these scholars recognize that international phenomena are the result of heterogenous factors operating at different levels. This dissatisfaction with unidimensional or unicausal theory has resulted in research that employs not only factors of the international system, but also recognizes the relative autonomy of state and society (Palen 1992, 24).

Palen's description of second structuralist theories share many characteristics with this dissertation. This study wants to account for relative changes in the international trade of Britain, France, and Japan from 1950-1989. However, the empirical studies mentioned in the literature review have illustrated that hegemonic stability theory has been less than impressive. Although some aspects of international trade can be explained by changes in hegemony, an improved theory

of international trade will also recognize the explanatory role of the relative strength of states and their societies. The remainder of this chapter will be divided into two sections. The first section will discuss the theoretical contributions and limitations of hegemonic stability theory, and the second section will discuss how a theory of state and society can make an additional explanatory contribution for the relative trade of Britain, France, and Japan.

Strengths and Weaknesses of Hegemonic Stability Theory

Hegemonic stability theory is founded on the assumption that in a non-hegemonic international system, states are reluctant to trade with each other because the international economic environment is too unstable to assure that trade would be beneficial. In order for trade to grow, one state must have the capability and willingness to impose stability on the international system. A state that accomplished this would benefit from greater international trade while simultaneously providing a collective good in terms of the international stability which allows all states to benefit from international trade (Kindleberger 1981, 249-50).

The collective goods aspect of hegemonic stability theory, although theoretically valid, is compromised by an equally valid aspect of political realism involving the importance of relative gains. Although all states may benefit from trading within a stable international system, some states will receive more benefits relative to other states. This will lead some states to avoid international trade for fear that it may benefit a rival state (Krasner 1976, 321-23). The concepts of

collective goods and relative gains create an inherent conflict within hegemonic stability theory. This conflict has not escaped scholarly attention.

The assumption that a hegemon must provide a collective good has been called into question. Duncan Snidal (1985) shows that hegemonic stability theory ignores the differing consequences of absolute verses relative gains for the hegemonic power. If the hegemon's only motivation for providing a collective good was to enjoy absolute gains regardless if others gained more, then the service is truly a collective good because all participants benefit without having to bear the costs of providing the collective good. However, if the hegemon wishes to prevent other states from securing relative gains which threaten the hegemon, then the so-called "collective good" must be something that benefits the hegemon more that it does others. In the first case the hegemon is benevolent in providing a service which rewards others more than it does itself. In the second case the hegemon is malevolent in that it imposes a type of international order which compels other states to remain subordinate (Snidal 1985, 585).

Bruce Russett (1985) claims that the goods resulting from U.S. hegemony are best described as private goods benefiting the U.S. rather than collective goods which benefit everyone. Russett discusses three false assumptions in the collective goods version of hegemonic stability theory. First, rather than the U.S. paying disproportionately to supply collective goods, it cost the European powers much more to decolonize than it cost the U.S. to support the post-World War II order. Related to this, rather than the U.S. sacrificing short-term gains for long-term gains, the U.S. also received great economic benefits in the short-term. Finally, whereas

a collective good is considered to be nonrival (enjoyment by one does not diminish the enjoyment by others) and nonexclusive (others can not be prevented from enjoying it), neither of these accurately describe the economic leadership provided by the United States. Often an agreement to trade or sell goods is made at the expense of a competitor, and economic boycotts surely do not satisfy the requirements for nonexclusiveness (Russett 1985, 222-27).

Some scholars have criticized the assumed connection between a rational hegemon and an open trading system. John Conybeare (1984) has argued that rather than selflessly promoting free trade, a rational self-interested hegemon would exploit its near monopolistic advantage by imposing optimal tariffs and thereby extracting rents from its trading partners. Further, in those instances in which a truly collective good existed, it may not require the support of a hegemon. Thomas Schelling (1978) claims that theoretically a K group (subgroup) of actors could provide the same service as a privileged group (hegemon). If they would all benefit from such an act, then they could agree to share the costs of providing a collective good. Thus, a small group of states could work together to support an open trading system as long as they gained from free trade.

Joanne Gowa (1989) has found fault with this kind of analysis and defends the necessity of hegemonic support for an open trading system. A hegemon may be willing to forgo the short-term gains from an optimal tariff in order to preserve long-term strategic relations with other states. Further, the complexity of the international system prevents small groups from possessing the information they need in order to work together to provide a collective good. Finally, above it was

claimed that the collective good provided by a hegemon did not pass the test of nonexclusiveness. However, by assuming the responsibility of punishing defectors, the hegemon prolongs the openness and efficiency of the trading system. This in itself is a collective good.

The importance of relative gains lies at the heart of security concerns of states. Earlier it was theorized that one state would avoid trading with a potentially rival state if it was believed that the rival state would benefit more from trading. Although this may be true in theory, the bipolar international structure that existed from 1950 to 1989 presented the U.S. with a security preference that allowed states within the American sphere of influence to exploit trade with the U.S. In other words, the U.S. would allow states in western Europe and Japan to acquire impressive relative gains through trade with the U.S. in return for their support of U.S. security objectives (Krasner 1976, 337).

It should be mentioned once again that most of the theoretical criticism concerning hegemonic stability theory is conducted in light of the theory's explanation for international system characteristics such as stability, openness, liberalization, etc. This is slightly different from the focus of this dissertation which is attempting to account for relative changes in the international trade of Britain, France, and Japan from 1950 to 1989. Nevertheless, the theoretical and empirical limitations of hegemonic stability theory are directly applicable to this study. The theoretical criticisms presented earlier offer an explanation for the limited success of hegemonic stability theory in accounting for aspects of the international system. In spite of its weaknesses, a review of the empirical findings has shown that U.S.

hegemony is associated with a few important characteristics of the international system. From a theoretical standpoint, it must be concluded that changes in U.S. hegemony are at best merely a necessary rather than sufficient explanation for real changes in the international trade of Britain, France, and Japan.

In order to offer an improved accounting of the relative international trade of these states, it will be necessary to complement hegemonic stability theory with a theoretical foundation for the trade preferences of individual countries. In this manner, it will be possible to offer a theory that promises to partially account for the relative international trade of Britain, France, and Japan based on factors unique to each of these countries rather than relying solely on U.S. hegemony.

State, Society, and International Trade

Michael Mastanduno, David Lake, and G. John Ikenberry (1989) believe that they have constructed the bases for an improved realist theory of state action. They claim that both classical realism and structural realism are not adequate for explaining state behavior. Classical realism possesses the same weaknesses as explanations which focus only on domestic factors such as interest groups or political parties in that it attempts to explain state behavior primarily in terms of the domestic sources of power or capabilities. Structural realism (e.g., hegemonic stability theory) attempts to explain state behavior in terms of a state's location within the structure of the international system. In other words, the source of state behavior lies in the international system. In contrast to these two approaches Mastanduno, Lake, and Ikenberry claim that the state lies at the intersection

between domestic and international politics. Governments frequently execute a particular foreign policy for domestic reasons and enforce certain domestic policies for international reasons, often simultaneously (Mastanduno, Lake, and Ikenberry 1989, 457-58).

By categorizing states according to their relative international weakness or power, and then again distinguishing between decentralized and centralized state governments, Mastanduno, Lake, and Ikenberry deduced the minimal strategies that states must enact in order to survive. Internationally powerful states will practice "external extraction". This involves the state accumulating resources from outside its borders. These resources can be acquired either directly, in the form of international transfer payments to the state itself, or resources can be transferred through international trade to society, whereby a portion may be later extracted by the state. In this manner, international trade makes resources indirectly available to the state, which the state can then use to compensate or coerce society (Mastanduno, Lake, and Ikenberry 1989, 464). Therefore, increases in a state's international trade can be interpreted, in part, as a strategy for pursuing a domestic objective. Furthermore, economically powerful states can use their advantage to alter the terms of trade in their favor, thereby maximizing the resources that they extract.

Mastanduno, Lake, and Ikenberry further claim that a highly centralized state is relatively autonomous vis-a-vis its society and would forgo international trade in favor of extracting resources through "internal mobilization"(1989, 463). This involves imposing a domestic restructuring of material and human resources in order

to build a strong economic base accessible to the state as a source for state power. On the other hand, a decentralized state does not have the option of maximizing resources through internal mobilization. Since the lack of centralized control deprives state leaders the autonomy needed to impose a restructuring of domestic resources, state leaders must focus on extracting resources from outside their borders. Therefore, if a state is domestically decentralized, but internationally powerful, state leaders can exploit its privileged international position by encouraging domestic industry to participate in international trade. This transfers resources to society, thereby giving state leaders a greater base of extractable resources which can then be used as a means to enhance the state's international and domestic interests.

The more powerful the state is relative to other states, the more successful it will be at extracting resources from other states. Therefore, as a state gains in international power relative to other states, its trade should also increase. However, the increase in trade should not simply be equal in proportion to the growth of the domestic economy. Rather, trade should increase relative to the size of the economy. In other words, when a state's real international economic power increases, it should also be able to extract increasingly greater amounts of resources from other states, and will therefore increase its involvement in international trade relative to its economic size. Further, it stands to reason that states which are internationally powerful, but lack the degree of domestic centralization needed to meet their resource demands through internal mobilization, will be the type of states which most aggressively pursue international trade. Such a state is the focus of this

study. This type of state would employ its position of economic privilege to pursue international trade as a means of maximizing societal resources. The state would then increase its penetration and political control over society in order to extract increasing amounts of these resources. A portion of the extracted resources would then be used to compensate or coerce society in order to gain their cooperation in the pursuit of state goals.

For the purposes of this study, the extent to which the state is involved in the domestic extraction and redistribution of resources will be conceptualized as a state's domestic regulatory capacity. However, predictions concerning changes in a state's domestic regulatory capacity will be contingent upon whether the researcher holds an active or passive view of the state. A passive view would assume that a state will be resigned to maintain its existing level of domestic regulatory capacity even when the society is enjoying greater resources. In other words, any increases in a state's domestic extraction and redistribution remain proportionate to increases in the resources of its society. Although the state may be extracting and redistributing more resources in absolute terms, it does not increase its extraction and redistribution capabilities in real terms vis-a-vis society.

On the other hand, a more active view of the state would assume that, when given the opportunity, a state will expand its domestic extraction and redistribution capabilities thereby increasing its regulatory capacity over society. A state is presented with such an opportunity during periods when the society is increasing its resources. Knowing this, state leaders will promote policies that increase international trade. This provides the leaders with an increasing pool of extractable

wealth that can be used to finance the state's perennial attempts at regulating the domestic economy and society. Thus, every promise of more domestic welfare, stability, or equality must be funded through increased taxes. The increased tax revenue must come either directly in the form of taxes on trade, or indirectly in the form of taxes on the economic growth spurred by trade. During such a period, a state can increase the proportion of resources that it extracts and redistributes without society necessarily incurring an absolute reduction in its resources.

Some scholars examining the institutional development of the state raise doubt that a centralized and ostensibly autonomous state is capable of realizing its long term goals if these goals are contrary to the interests of society. It has been argued that "state interventions in socioeconomic life can, over time, lead to a diminution of state autonomy and to a reduction of any capacities the state may have for coherent action" (Evans, Rueschemeyer, Skocpol 1985, 354). In other words, the institutions created to increase the state's domestic control may in fact be used by social groups as a channel for directly influencing state actions. Helen Milner (1988) has demonstrated why it is misleading to conclude that France's centralized government is indicative of its strength over society. Even when the society is deeply penetrated by the state bureaucracy and other state institutions, these institutions are dependent on the expertise of dominant social groups for formulating and executing policy. In this manner, even a centralized and ostensibly autonomous state is greatly influenced by societal interests.

Mastanduno, Lake, and Ikenberry have gone a long way toward constructing a theory of state action that integrates important factors of international and

domestic politics. However, their theory will need to be adapted in order to give a theoretical explanation for the international and domestic factors affecting the international trade of individual states. In order to construct such a theory, a decision must be made concerning the important international and domestic factors affecting a state's trade actions. For reasons discussed in greater detail below, the two factors believed to affect the international trade of individual states are relative international economic power and domestic regulatory capacity.

Thus far, this study has discussed the theoretical connection between U.S. hegemony and international trade. Additionally, by employing a realist theory of state action, this study has theoretically established that international and domestic factors of a particular state will work together to affect the international trade of that state. These international and domestic factors have been conceptualized as relative international economic power and domestic regulatory capacity. Therefore, the argument can now be made that a strong theoretical connection exists between real changes in a state's international trade, and changes in each of the following three factors: U.S. hegemony, a state's relative international economic power, and a state's domestic regulatory capacity. However, before this can be tested,the research design must be specified, variables must be operationalized, and the nature and direction of the relationship must be explored.

Research Design

This study assumes that the state sits at the intersection between domestic and international politics. Therefore, the state is the appropriate unit of analysis.

Throughout this study the term "state" is used in a broad sense. Although it could be argued that in fact society is the source of economic power, or that governments extract revenue and redistribute resources, the term "state" is preferred for several reasons. From a theoretical perspective, this study is conducted within the framework of political realism. It assumes that states have interests and goals (e.g., survival, international prestige, national consensus) which cannot be easily captured by terms like government or society. Given this theoretical premise, the term state will be used when exploring the relationship between international economic power, domestic regulatory capacity, and international trade.

Changes in a state's relative international power encourage it to expand or retract its involvement in international trade, which in turn creates or deteriorates the social conditions which allow the state to realize advances in its regulatory capacity vis-a-vis society. Therefore, with reference to the first hypothesis, international power will function as the independent variable and relative trade will function as the dependent variable. Concerning the second hypothesis, international trade will be the independent variable and domestic regulatory capacity will be the dependent variable.

The study is limited to an investigation of Britain, France, and Japan from 1950 to 1989. These three states have been chosen for several reasons. First, the states are comparable to each other in that all three of these states are developed industrial democracies. This will allow the findings to be compared or contrasted with a higher degree of validity than if the states had vast economic and political differences. For example, in attempting to make direct comparisons between

developed industrial democracies, communist states, and underdeveloped countries, one is left primarily with contrasts and any findings common to all three types of states may in fact be spurious.

The second reason for selecting these particular states is because they all have undergone major shifts in their international power since 1950. Furthermore, although each of these states are recognized democracies, each represents a different degree of governmental centralization. Arguably, Japan could be viewed as more centralized than France, and both of these states more centralized than Britain. Nevertheless, few would argue that the degree of government centralization in any of these states is of a similar nature to the centralized planning of the formerly communist states. Therefore, within the category of industrial democracies, the various degrees of government centralization found in Britain, France, and Japan provide diversity, without being so diverse that they are not directly comparable. They will therefore be good cases for studying the relationship between these political variables and changes in the trade practices of each.

The objective of this study is to give a account of changes in the relative trade of Britain, France, and Japan from 1950 to 1989. This will be accomplished by constructing an econometric time-series multiple regression model in which indicators of U.S. economic hegemony, indicators of the relative international economic power of Britain, France, and Japan, and indicators of the domestic regulatory capacity of Britain, France, and Japan are used as independent variables. More elaborate theories of hegemonic stability would explain the rise of relative trade for each of these states in terms of greater cooperation brought about by U.S.

support of international regimes (Keohane, 1984). In this manner it could be argued that Britain, France, and Japan are more inclined than most other states to benefit from following international regimes and practicing non-hegemonic cooperation. Although this may or may not be the case, it is also possible that changes in the relative trade of each of these states are related to important shifts in the international economic power and domestic regulatory capacity of each. An equally convincing argument could be made that from 1950 to 1989, these three states had undergone significant changes in their international economic power and domestic regulatory capacity, and these changes offer the best account for changes in their relative trade. Although the more elaborate versions of hegemonic stability theory make important heuristic contributions, this study explores the possibility that real in addition to U.S. economic hegemony, relative changes in international trade of Britain, France, and Japan may be due to factors unique to the states themselves.

Operationalizing Variables

This study proposes to explain relative changes in the international trade of Britain, France, and Japan from 1950 to 1989 in terms of important factors of the international and domestic political economy. These factors are U.S. economic hegemony, each state's relative international economic power, and each state's domestic regulatory capacity. However, thus far these factors exist only as theoretical concepts which must first be operationalized in a manner that is theoretically valid and reliably testable. In order to capture some of the various aspects of these factors, each of the independent variables has been operationalized

in two different ways. By operationalizing two separate indicators for U.S. hegemony, each state's relative international economic power, and each state's domestic regulatory capacity, different aspects of these factors that are popular in the current literature can be captured. In addition to the following discussion of the selection of operational variables, a detailed accounting of the construction of each of these variables is presented in Appendix A, pages 146-149.

Relative Trade

Relative trade functions as the dependent variable in this study. Relative trade has been selected because of the emphasis that this study gives to relative changes rather than absolute changes. It is assumed that most industrialized countries will experience and increase in international trade as their domestic economies grow. This should not be surprising given the assumption that growing economic activity will be accompanied by absolute increases in increases in international trade. More revealing, however, are changes in a state's international trade relative to changes in its domestic economy. In other words, measuring a state's international trade relative to its gross domestic product will account for fundamental shifts in the extent to which trade composes the domestic economy. A relative measure of international trade will show the degree that the domestic economy is dependent and/or exposed to international trade. Therefore, for the purposes of this study, a states relative trade will be operationalized as the sum of a state's exports and imports, divided by the state's gross domestic product.

Relative International Economic Power

The selection of relative international economic power is straight forward. The relative nature of this factor is important because of the theoretical assumption based on political realism that relative changes (rather than absolute changes) in state power are central in affecting the way that states interact with each other. Furthermore, measures of economic power are preferred over measures of military power because it is believed that economic power is more central to this research question.

Both of the definitions of international power operationalized below have at least two common characteristics. First, they focus on measuring changes in relative power rather than changes in absolute power. This is so because changes in a state's location within the international structure are more important than absolute changes in a state's measurable power. In other words, it is relative shifts in state power which will evoke different state outcomes. The second common characteristic of these definitions is that they will measure economic sources of political power rather than focusing on additional factors such as military strength or political leadership.

The third common characteristic of these measures of relative international economic power is that the two variable discussed below will be use to measure both U.S. economic hegemony and the relative international economic power of Britain, France, and Japan. Because both U.S. economic hegemony and a state's relative international economic power are factors of the international system, it would be misleading to use one measure of U.S. economic hegemony relative to the other

states in the international system, and then use a different type of economic variable to measure a particular state's economic power relative to other states in the international system. Therefore, in order to avoid the mistake of "comparing apples to oranges" within the same regression model, both U.S. economic hegemony and a state's relative international economic power will be operationalized by separately employing the two indicators discussed below.

Relative Economic Size

A popular method of determining a state's power is to look at aggregate measures of its economic capabilities (Kindleberger, 1973; Gilpin, 1975; Krasner, 1976). One of the most widely used measures is gross domestic product (GDP). GDP is an annual measure of the total goods and services produced within the borders of a country. For the purposes of this paper, a country's relative economic size is calculated as its gross domestic product divided by the total gross domestic product of all OECD countries. In this manner, the larger a state's GDP is relative to the GDP of the OECD, the more economically powerful a state is considered to be.

Relative Labor Productivity

David Lake (1988) believes that a state's trade policy preferences and strategies are significantly influenced by the position a state holds within the international economic structure. One of the principal factors which account for this structure and a state's position within it is the state's relative labor productivity.

Relative labor productivity is calculated as the national output per worker-hour relative to the average national output per worker-hour in comparable countries. Relative labor productivity is important because it captures the compounding returns inherent in a developed industrial economy (Lake 1988, 40-41). Classical and neoclassical theories of trade assume that all industries have constant returns to scale. Thus, these theories do not accurately depict the real benefits of advanced industrial production. Industries at the technological forefront do more than produce a constant return on their investment. These industries enjoy positive spinoffs and increasing returns to scale which result in the creation of new industries and more wealth. Although states which possess older industries with constant returns to scale may benefit from free trade, they do not benefit to the same extent as states with advanced industries. The higher productivity enjoyed by such industries is captured in the measure of relative labor productivity.

David Lake (1988) claims that states with high levels of relative labor productivity will prefer that foreigners practice free trade. However, their willingness to open their domestic markets to foreign trade will be influenced by their relative market size, defined as their percentage of world trade. For the purposes of this study, the explanatory role of relative labor productivity will differ from Lake's work in two important ways. First, Lake employs measures of relative labor productivity and relative market size in order to account for U.S. trade policy preferences. Rather than attempting to explain economic policy preferences, this study explores ways to account for relative changes in a state's amount of trade. Second, whereas Lake employs a production measure and a trade measure as

independent variables, this present study uses relative labor productivity as an independent variable and a relative measure of international trade as a dependent variable. Regardless of the extent to which policy preferences are transformed into trade practices, it is reasonable to assume that over time, higher levels of relative labor productivity should be related to higher levels of relative trade. It also seems unlikely that higher levels of a state's relative labor productivity, over time, could be accompanied by decreasing levels in its market size which might decrease the levels of relative trade. In light of this, relative labor productivity is an appropriate independent variable for exploring changes in a state's relative trade (Lake 1988, 233-36).

Domestic Regulatory Capacity

Domestic regulatory capacity is intended to be a concept that focuses on the extent to which a state is involved in regulating economic matters within its society. It can do this by extracting taxes or by allocating social spending with the intent of compensating certain individuals and/or enhancing the government's legitimacy. The assumption is made that a state's domestic regulatory capacity is related to its international trade because trade is needed to produce a growing economy that can support increases in taxes and social spending.

Domestic regulatory capacity is intended to capture the degree of regulatory resources employed by the state in relation to society. In recent years the state-centered literature has attempted to make a distinction between strong and weak states in terms of the state's influence over society. Much emphasis has been placed

on the importance of a strong state for successfully meeting economic and political challenges (Katzenstein 1978, Conclusion; Krasner 1976). Strong states are usually perceived as deeply penetrating society and able to regulate behavior and events within it. On the other hand, weak states lack these characteristics and are forced to follow society's lead. In light of this, two measures are presented below which aim to capture important aspects of a state's regulatory capacity.

Infrastructural Power

Lewis Snider has constructed a measure of a state's domestic power over its society which he calls infrastructural power. According to Snider, a functional definition of a state's power over society must be able to capture "the capacity of the state to penetrate society, to extract resources from the population, and to mobilize and redirect them to serve state objectives" (Snider 1987, 318). A state that is powerful in this manner would also exercise a comparable degree of regulatory capacity over its society. Therefore, Snider's definition of infrastructural power is also an appropriate definition of state regulatory capacity for the purposes of this study.

Infrastructural power is calculated as the product of two measures of a state's capabilities of extracting taxes from society. Relative political capacity (RPC) measures the amount of tax revenue extracted, while average penetration capacity (APC) captures the degree to which the state penetrates society in order to extract revenue. Whereas Snider developed theses measures in order to make comparisons between countries, for this study they will be adjusted in order to make a

comparison between an individual state and its society. RPC will be measured as the total annual government revenue divided by gross domestic product. APC will distinguish between direct taxes (e.g., personal taxes, corporate taxes, etc.) and indirect taxes (e.g., sales taxes, trade taxes, nationalized industry). Although both direct and indirect taxes may generate significant amounts of revenue, direct taxes require a deeper penetration into society. Additionally, indirect tax revenues are more susceptible to external economic shocks. Therefore, dividing direct taxes by indirect taxes gives an indication of the degree to which a state penetrates society in order to extract revenue. The measure for infrastructural power is produced by multiplying RPC by APC.

Relative Domestic Transfer Payments

In the literature review of this paper, John G. Ruggie's (1982) concept of embedded liberalism was briefly discussed as a possible explanation for the trade practices of states. This concept will now be used to construct a measure that captures a portion of a state's regulatory capacity. Ruggie claims that U.S. hegemony has characterized the international system during the post-World War II era. Additionally, the United States, Western Europe, and Japan have shared the same social purpose of multilateral trade and domestic stability. They have also shared similar views for securing the dichotomous goals of free trade and domestic welfare. On the international level they supported and participated in international regimes as a way of governing the growth of trade. On the domestic level they all practiced elements of Keynesian demand management in order to maximize

employment and prevent the boom and bust characteristic of an unregulated economy. Whereas much has been written concerning the relationship between international regimes and international trade, little has been written concerning the relationship between domestic economic management and international trade.

Nevertheless, it is reasonable to assume that a relationship exists between the degree of a state's Keynesian macropolicies and its degree of international trade such that international trade plays an important role in providing the additional resources needed for the state to assist in regulating the domestic economy. Although international trade may increase the social resources available to the state, the state must employ a certain amount of these resources in a manner that helps regulate the negative effects of international trade. Peter J. Katzenstein (1985, 54) has shown that during the post-World War II rise in international economic liberalization, transfer payments to households and producers has increased as a percentage of GNP. This increase was most dramatic for the small European states whose domestic societies where also the most vulnerable to the demands placed on them by the changing international economy. Although to a lesser degree than small states, large states must nevertheless address societal demands for governmental assistance to relieve the domestic strains resulting from changes in the international economy. Therefore, it would be expected that as international trade increases as a percentage of GDP, government assistance should also increase as a percentage of GDP.

Government transfer payments to households and individuals are an important form of government assistance. Therefore, in order to construct an

operational definition for the domestic component of embedded liberalism, this study will employ the following three types of transfer payments: social security benefits, social assistance grants, and transfers to non-profit institutions serving households. These particular transfer payments have been selected because they provide a social safety net for individuals, while also providing the domestic economy with a reliable source of consumer demand. It will be assumed that an increase in government transfer payments to households as a percentage of GDP represents the state's attempt to regulate society by providing compensation to individuals while also providing a demand stimulus for the economy. In this manner, domestic transfer payments relative to GDP should be associated with changes in Relative Trade.

CHAPTER THREE:

HYPOTHESES DEVELOPMENT AND RESEARCH METHODS

Hypotheses Development

In the previous chapter, various aspects of contemporary international political economy theory were integrated in order to construct a theoretical foundation in which relative changes in the international trade of Britain, France, and Japan are associated with the following three factors: U.S. economic hegemony, each country's relative international economic power, and each country's domestic regulatory capacity. Two indicators have been selected for each of these three factors. U.S. economic hegemony is operationalized by measuring U.S. labor productivity relative to the labor productivity of the OECD countries (U.S. Relative Labor Productivity). The second indicator of U.S. economic hegemony measures U.S. gross domestic product relative to the gross domestic product of the OECD countries (U.S. Relative Economic Size). The two operational measures selected as indicators of the relative international economic power for Britain, France, and Japan are the same as those selected for U.S. economic hegemony. Thus, for example, Britain's relative international economic power is operationalized by measuring Britain's Relative Labor Productivity and Relative Economic Size. Finally, the domestic regulatory capacity of Britain, France, and Japan is

operationalized by constructing a measure of taxes relative to gross domestic product (Infrastructural Power), and secondly by measuring government domestic transfer payment made to households as a percentage of gross domestic product (Relative Domestic Transfer Payments).

In order to determine the extent to which changes in the independent variables account for changes in the dependent variables, it is first necessary to determine the nature of the relationship between the dependent and independent variables. It is often the case with economic data that relationships between variables are curvilinear. This in itself is a relatively safe assumption. However, it is a different matter altogether to hypothesize the direction of the relationship and the conditions under which that direction would be expected to change. In order to do this it must first be decided if the curvilinear relationships follow a predetermined and predictable pattern over time, or if changes in the direction of the relationships are chaotic over time. In the first case, changes in the direction of the relationship over time would appear as waves. Under this assumption, the best predictor of the direction of a relationship would be previous patterns manifested by the relationship. However, such an assumption limits the range of possible explanations by discounting structural factors that stem from changes in the independent variable in favor of explanations which are the predetermined or inevitable products of waves or cycles (Richards 1993; Beck 1991).

On the other hand, if it is assumed that changes in the direction of a relationship over time are chaotic (i.e., past patterns cannot predict future patterns),

then any directional changes must be due to shifts in underlying structural factors. For example, directional changes in the relationship between Britain's Relative Trade are best accounted for by changes in Britain's Relative Labor Productivity rather than by something inherent to Relative Trade itself. Furthermore, since these directional patterns are not attributed to previous predictable patterns, then they must be accounted for by employing structural changes in the dependent variable to explain changes in the dependent variable. In order to do this, a theoretical context must be established which will provide a rationale for these directional changes. Much of the literature which discusses the relationship between international trade and structural factors of states and the international system assumes that the directional changes are the intentional result of state's pursuing their national interest, usually defined in terms of international power and domestic welfare.

Some scholars have drawn theoretical conclusions which infer a possible curvilinear relationship between the dependent and independent variables used in this study. John Conybeare (1987) has suggested that as a state's market size increases, rather than increasing its relative trade, it will be able to maximize its gains by imposing and optimal tariff. This would decrease its relative trade thereby creating an inverse relationship between relative trade and market size. Joanne Gowa (1989) extends this argument by suggesting that although this inverse relationship between market size and trade may be true for states with low to

moderate market size, states with moderate to large market size may increase their relative trade in order to gain political influence over smaller trading partners.

Edward D. Mansfield (1992) has presented empirical support for Gowa's thesis. Mansfield showed that at the level of the international system, global relative trade follows a U-shaped pattern when plotted against the degree of power concentration in the international system. In other words, global relative trade was high when the participating states were relatively equal to each other in power. As some states gained in power relative to other states, global relative trade declined. This continued until power was concentrated in one state (hegemon) which was then followed by a rise in global relative trade.

With reference to this study, the theoretical and empirical work presented above would suggest that similar relationships might exist between Relative Trade, U.S. economic hegemony, and the relative international economic power of Britain, France, and Japan. (Domestic regulatory capacity will be discussed later.) For example, at high levels of U.S. economic hegemony, the Relative Trade of Britain, France and Japan should be high. This is because the U.S. enjoys political and economic benefits from trade, and its overwhelming economic strength allows the U.S. to impose this preference on other countries. Thus, the Relative Trade of Britain, France, and Japan should be high at high levels of U.S. economic hegemony. However, as U.S. economic hegemony declines, Britain, France, and Japan can exercise more economic independence relative to the U.S. It is theorized that they would decrease their relative trade in favor of becoming more economically

autonomous. When U.S. economic hegemony declines to the point that Britain, France, and Japan are no longer threatened by U.S. trade demands, then their Relative Trade should increase as the U.S. declines from moderate to low levels of economic hegemony. Therefore, the relationship between U.S. economic hegemony and the Relative Trade of Britain, France, and Japan should be essentially U-shaped.

Concerning the relationship between the relative international economic power of Britain, France, and Japan, and their own Relative Trade, a similar U-shaped pattern is expected. In this case, the theory presented earlier would lead to the expectation that low levels of the relative international economic power of Britain, France, and Japan would be associated with high levels of Relative Trade. This is because when the relative international economic power of these countries is low, they are compelled to expose themselves to trade with more powerful countries. However, as the relative international economic power of Britain, France, and Japan increases, they are better able to resist trade and concentrate on establishing economic autonomy. If the relative international economic power of Britain, France and Japan becomes great enough, then they will be able to impose trade practices which benefit their economic growth without diminishing their economic independence. Therefore, given these assumptions, it should be expected that from low to moderate levels of their relative international economic power, Britain, France, and Japan should be decreasing their Relative Trade. However, as their relative international economic power further increases from moderate to high levels, then Britain, France, and Japan should be increasing their Relative Trade.

Based on these theoretical and empirical findings, a strong possibility exists for a curvilinear relationship between the dependent and independent variables in this research. In order to verify this, three hypotheses were developed as a means of testing the nature and direction of the relationships between the dependent and independent variables. Using the conceptual variables presented earlier, the three hypotheses are:

H_1: Low levels of U.S. Economic Hegemony will be negatively related to the Relative Trade of Britain, France, and Japan; and high levels of U.S. Economic Hegemony will be positively related to Relative Trade of Britain, France, and Japan (U-shape).

H_2: Low levels of the Relative International Economic Power of Britain, France, and Japan will be negatively related to their Relative Trade, and high levels of their Relative International Economic Power will be positively related to their Relative Trade (U-shape).

H_3 will concern the relationship between Relative Trade and domestic regulatory capacity. However, further theoretical considerations must be made before H_3 can be formulated. Previously it was hypothesized that governments would promote trade as a means of producing growth and providing wealth that could then be extracted by the government. A portion of this extraction could then be used to compensate and stabilize the domestic society. In short, it was hypothesized that a positive relationship between domestic regulatory capacity and

Relative Trade. However, further considerations suggests that the relationship may change direction.

In the previous chapter, the theory of state action presented by Mastanduno, Lake, and Ikenberry (1989) was used to suggest that a state's amount of international trade will be effected by the degree of centralization of the domestic government. A decentralized state would depend on and encourage trade as a means of acquiring resources that could not be extracted domestically. On the other hand, states which are highly centralized would resist and diminish international trade in favor of extracting resources from its domestic society.

When these two theoretical premises are employed to theorize changes in the international trade of a state which over time has shifted from a decentralized to a centralized domestic structure, a curvilinear pattern of trade is predicted. From low to moderate levels of centralization, international trade is increasing relative to other economic factors. However, from moderate to high levels of centralization, the relative importance of trade declines as the government tries to protect the state from the risks associated with high exposure to international trade. Thus, the relationship between the degree of centralization of the domestic structure, and the relative importance of international trade produces a ∩-shaped pattern.

Given this theoretical grounding for the relationship between a state's degree of centralization and international trade, a similar type of relationship should be expected between the operational variables for domestic regulatory capacity and Relative Trade used in this study. There are at least two reason for this assumption.

First, once a government becomes involved in ensuring domestic economic stability and welfare, this involvement becomes one of the cornerstones of a government's legitimacy to rule. When a government is expected to provide ever increasing degrees of stabilization and welfare, then the government may decide to provide this at the expense of international trade. In other words, the conservation or expansion of high levels of domestic economic stability and welfare will be given precedence over economic growth. If it is believed that increased trade may expose the domestic economy to volatility, then trade will be sacrificed for the sake of domestic economic stability and predictability. Thus, high or growing levels of domestic regulatory capacity will be protected, even though in order to do so the government will have to reduce international trade, thereby diminishing economic growth.

A second possible reason that the direction of the relationship might change from positive to negative concerns the role of government directed investment. It may be that the increase in government revenues resulting from taxes on increased trade and domestic production are fed back into the domestic economy in a manner that augments domestic production. In this manner, high levels of domestic regulatory capacity would be associated with greater growth in GDP, thereby necessarily causing a decline in Relative Trade. In the first instance, Relative Trade [i.e., (imports + exports) / GDP] declines because of a decrease in the numerator, whereas in the second instance, Relative Trade declines because of an increase in the denominator. Nevertheless, both explanations account for a relationship

between Relative Trade and domestic regulatory capacity which produces a ∩-shaped pattern. Based on these theoretical considerations, H_3 can be stated as:

H_3: Low levels of the domestic regulatory capacity of Britain, France, and Japan will be positively related to their Relative Trade, and high levels of their domestic regulatory capacity will be negatively related to their Relative Trade (∩-shape).

Figures 1-12 illustrate the curvilinear directions of the relationship between Relative Trade and each of the operationalized independent variables. These are presented with Britain, France, and Japan pooled together, and with each country shown separately.

Relative Trade and Measures of U.S. Economic Hegemony

Figures 1-4 are presented as a means of testing H_1 concerning the direction of the relationship between U.S. economic hegemony and Relative Trade. The figures illustrate the two measures chosen as valid indicators of U.S. economic hegemony. The two operational versions of H_1 are expressed as:

H_{1a}: Low levels of U.S. Relative Labor Productivity will be negatively related to the Relative Trade of Britain, France, and Japan, and high levels of U.S. Relative Labor Productivity will be positively related to the Relative Trade of these counties.

H_{1b}: Low levels of U.S. Relative Economic Size will be negatively related to the Relative Trade of Britain, France, and Japan, and high levels of U.S. Relative

Economic Size will be positively related to the Relative Trade of these countries.

Figures 1 and 2 illustrate a pooling of the cases for Britain, France, and Japan. In each of these two graphs, Relative Trade is plotted with each of the two indicators chosen for U.S. economic hegemony. These graphs (and other pooled graphs) should be interpreted cautiously because the variances for both the dependent and independent variables are not the same for each of the three countries. Thus, the strength of the relationship can be masked by the dispersion of the data points. Nevertheless, a discernible U-shaped relationship is revealed when both U.S. Relative Labor Productivity, and U.S. Relative Economic Size are separately plotted with a pooling of the Relative Trade of Britain, France, and Japan.

Figures 3 and 4 examine the same variables, but for Britain only. A clearly defined U-shaped pattern is revealed for both U.S. Relative Labor Productivity in Figure 3, and U.S. Relative Economic Size in Figure 4. The similarity between these two plots would seem to lend support for the belief that both U.S. Relative Labor Productivity and U.S. Relative Economic Size measure similar aspects of U.S. economic hegemony. Furthermore, the tightness of the pattern would seem to indicate a strong relationship between the dependent and independent variables.

Figures 5 and 6 continue the examination of these indicators for U.S. economic hegemony, this time focusing on the country of France. Once again a curvilinear pattern is revealed for both U.S. Relative Labor Productivity in Figure

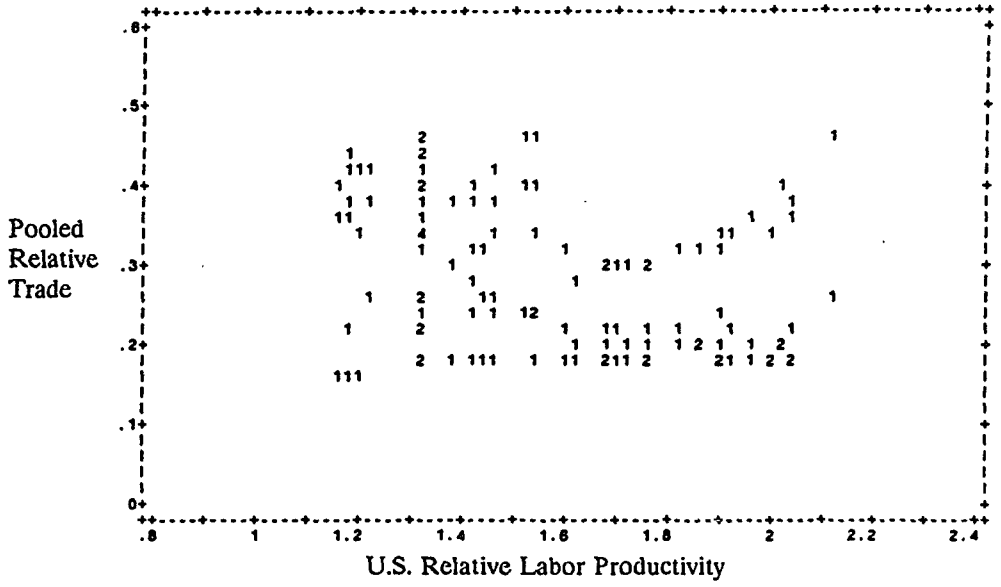

Figure 1. Plot of Pooled Relative Trade with U.S. Relative Labor Productivity 1950-1989[a]

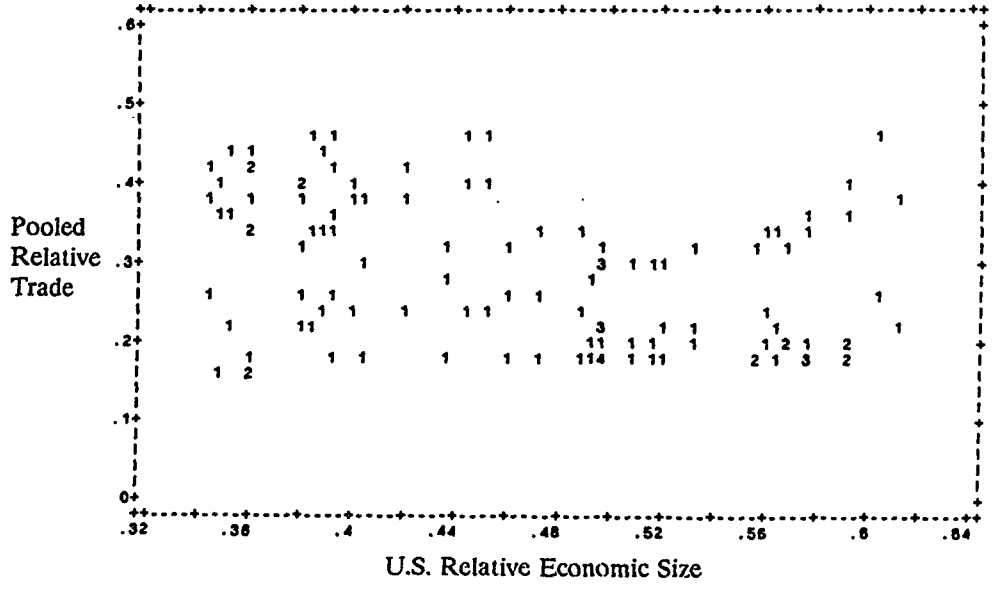

Figure 2. Plot of Pooled Relative Trade with U.S. Relative Economic Size 1950-1989[a]

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[a]Data for Japan begins in 1952.

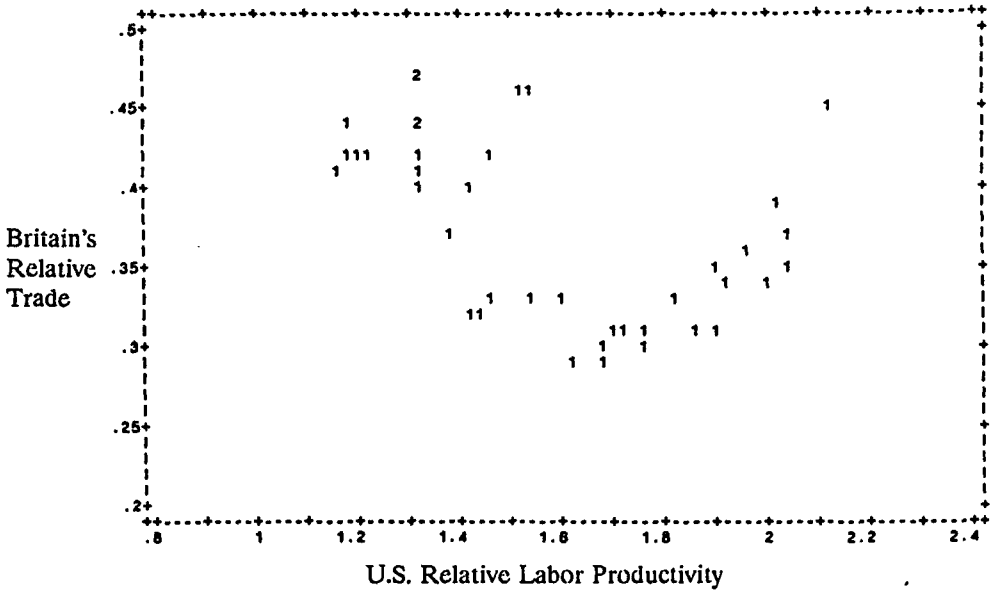

Figure 3. Plot of Britain's Relative Trade with U.S. Relative Labor Productivity 1950-1989

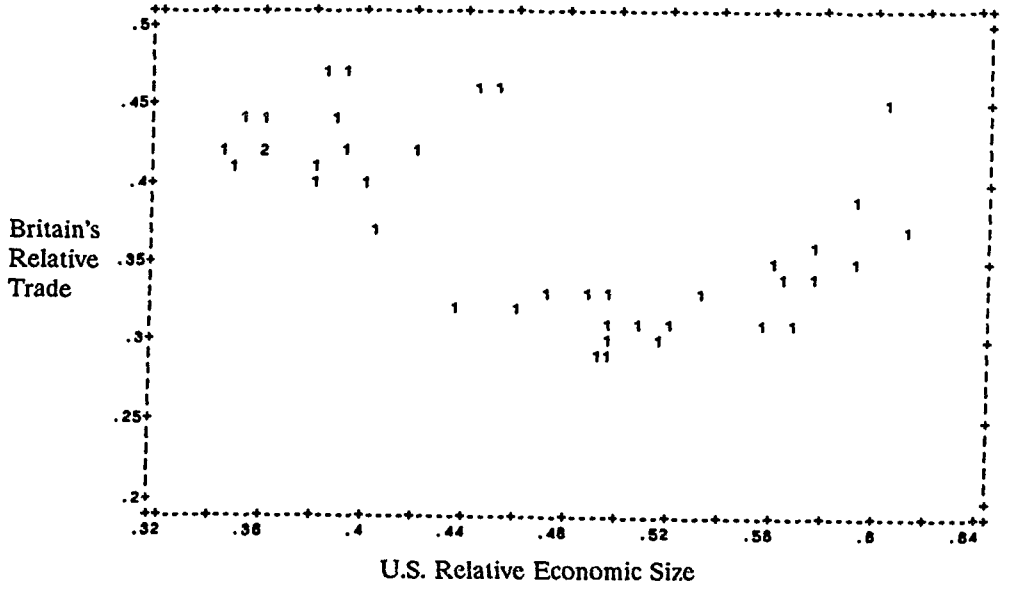

Figure 4. Plot of Britain's Relative Trade with U.S. Relative Economic Size 1950-1989

5, and U.S. Relative Economic Size in Figure 6. In the case of France, the U-shape is not as "complete" at higher levels of the independent variables when compared to Britain. Nevertheless, the beginnings of a positive relationship are clearly present in both figures when the independent variables are relatively high.

Figures 7 and 8 examine the case of Japan. In this instance, there does not appear to be much of a relationship of any kind between Japan's Relative Trade and measures of U.S. economic hegemony. The data points are widely dispersed, indicating a weak relationship between Relative Trade and both operational measures of U.S. economic hegemony. If a U-shaped pattern is present, it is camouflaged by the apparent weakness of the relationship. Any further discussion of a possible relationship must wait until a more rigorous examination is conducted later in this study.

Except for Japan, the plots presented in these figures failed to falsify both H_{1a} and H_{1b}. In the case of Japan, if the hypothesized nature of the relationships are present, the relationships are not strong enough to draw a definitive conclusion. Nevertheless, it can be concluded that (excluding Japan), low levels of U.S. Relative Labor Productivity and U.S. Relative Economic Size are negatively related to the Relative Trade, and high levels of U.S. Relative Labor Productivity and U.S. Relative Economic Size are positively related to the Relative Trade.

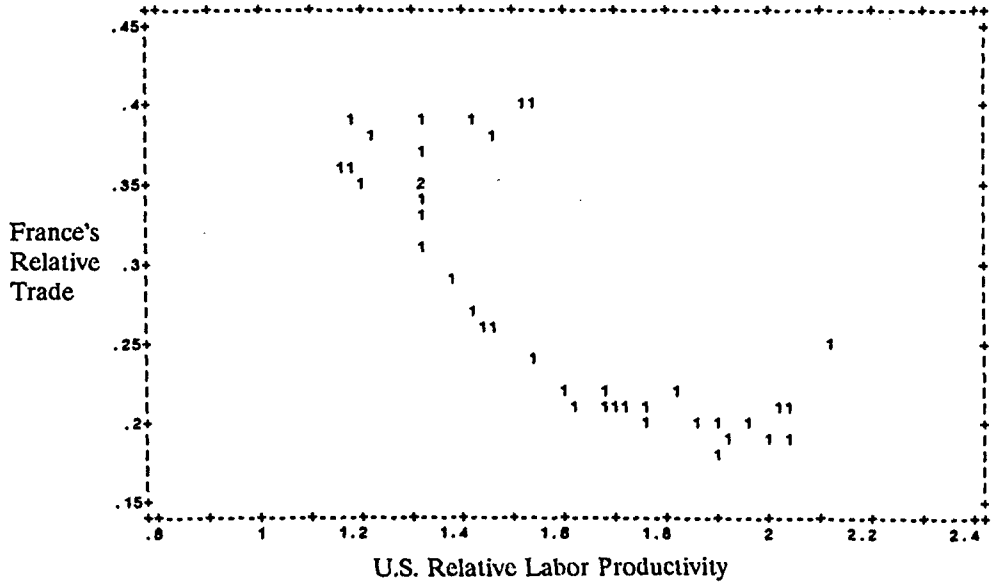

Figure 5. Plot of France's Relative Trade with
U.S. Relative Labor Productivity 1950-1989

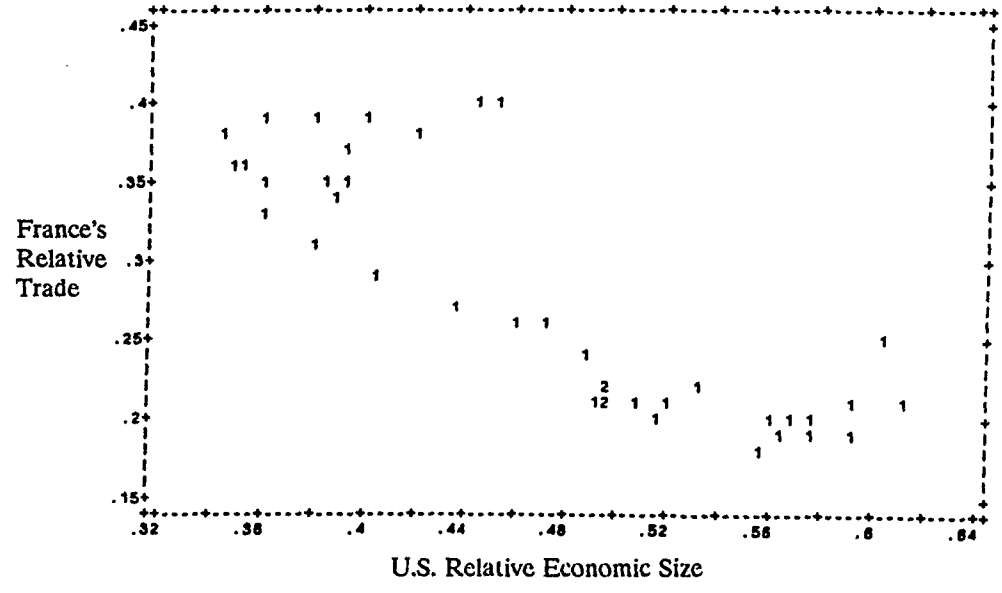

Figure 6. Plot of France's Relative Trade with
U.S. Relative Economic Size 1950-1989

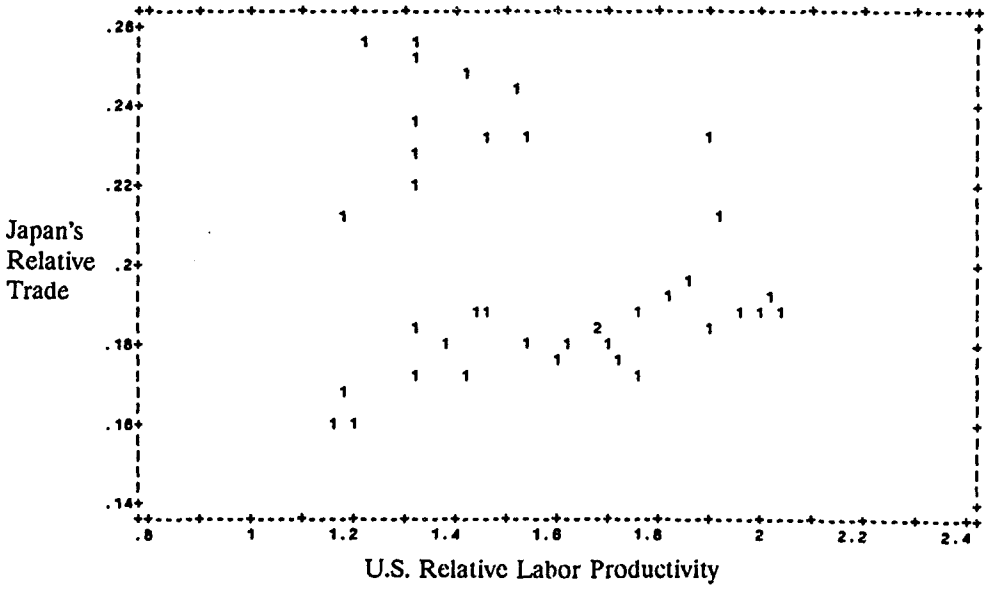

Figure 7. Plot of Japan's Relative Trade with U.S. Relative Labor Productivity 1952-1989

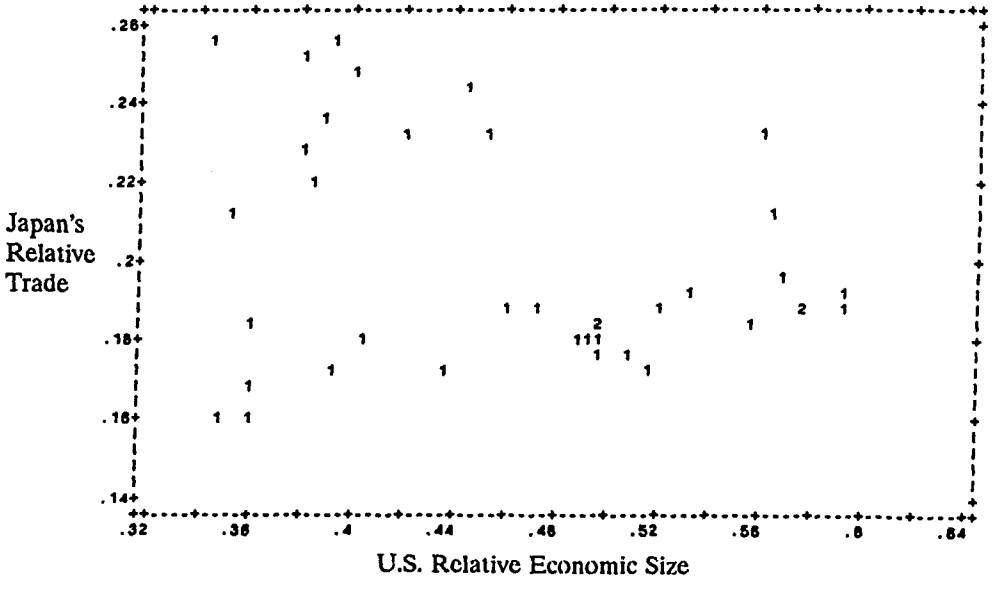

Figure 8. Plot of Japan's Relative Trade with U.S. Relative Economic Size 1952-1989

Relative Trade and Measures of Relative International Economic Power

Figures 9-16 are presented as a means of testing H_2 concerning the direction of the relationship between the relative international economic power of Britain, France, and Japan and the Relative Trade of these countries. These figures illustrate the two measures chosen as valid indicators of relative international economic power of each country, i.e., each country's Relative Labor Productivity, and each country's Relative Economic Size. The two operational versions of H_2 are expressed as:

H_{2a}: Low levels of the Relative Labor Productivity of Britain, France, and Japan will be negatively related to the Relative Trade of these countries, and high levels of their Relative Labor Productivity will be positively related to the Relative Trade of these counties.

H_{2b}: Low levels of the Relative Economic Size of Britain, France, and Japan will be negatively related to the Relative Trade of these countries, and high levels of their Relative Economic Size will be positively related to the Relative Trade of these counties.

Figures 9 and 10 show plots constructed by pooling Britain, France, and Japan in order to illustrate the direction of the relationship between Relative Trade and the two measures chosen to indicate the relative international economic power of each of the three countries. The two plots reveal a curvilinear pattern. However, the dissimilarity of variance in the variables for each of the three countries once again produces a pattern of data points which are difficult to interpret. At this point

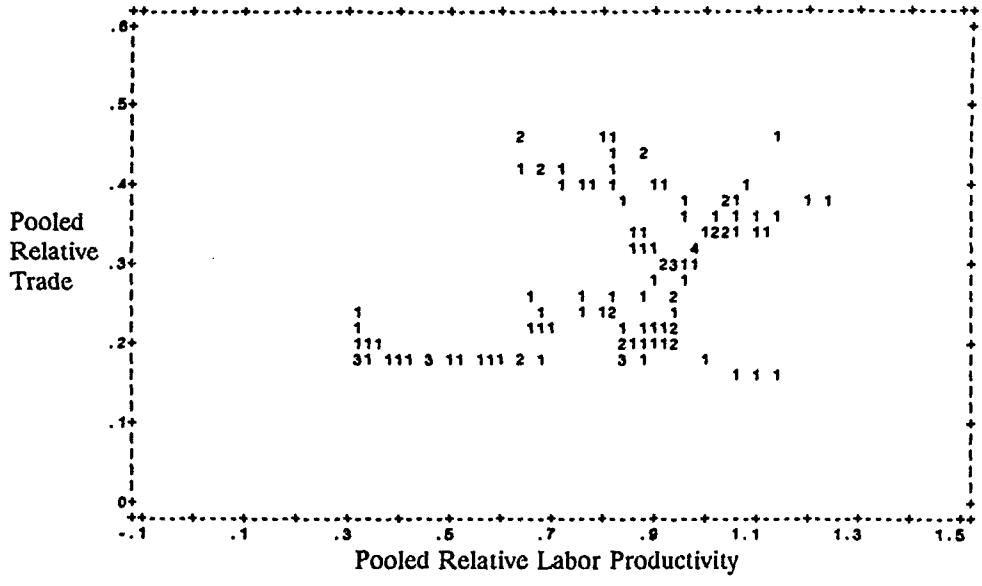

Figure 9. Plot of Pooled Relative Trade with Pooled Relative Labor Productivity 1950-1989[a]

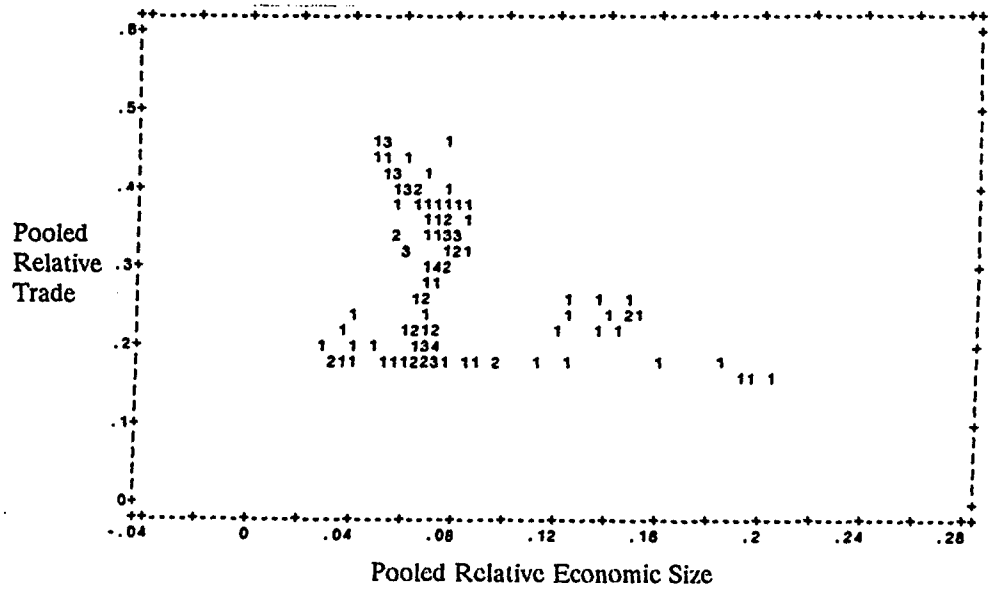

Figure 10. Plot of Pooled Relative Trade with Pooled Relative Economic Size 1950-1989[a]

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[a]Data for Japan begins in 1952.

it would seem that both pooled Relative Labor Productivity and pooled Relative Economic Size, when plotted with pooled Relative Trade, do not produce very similar patterns. However, conclusions must be drawn cautiously because the pooling of three different samples may be hiding important patterns produced by each individual country. Therefore, in order to better test H_{2a} and H_{2b}, a more accurate analysis of these patterns can be made by examining each country separately.

Figures 11 and 12 examine the case of Britain. When Britain's Relative Labor Productivity is plotted against Britain's Relative Trade as show in Figure 11, it produces a strong and clearly definable U-shaped pattern. Figure 12, showing Britain's Relative Economic Size plotted against Britain's Relative Trade, reveals a weaker relationship between these two variables. Nevertheless, the plot produces a discernable U-shape. Thus, both Figures 11 and 12 fail to falsify H_{2a} and H_{2b} respectively.

Figures 13 and 14 reveal that in the case of France, the patterns for Relative Labor Productivity and Relative Economic Size reveal an essentially positive linear relationship with Relative Trade. Figure 13 reveals a relatively strong relationship between France's Relative Labor Productivity and Relative Trade. However, there is no clear evidence of an inverse relationship at low measures of Frances Relative Labor productivity. Therefore, it is inconclusive as to whether or not Figure 13 supports or falsifies H_{2a}. Concerning Figure 14, the broad dispersion of the data points presents such a weak relationship that it is impossible to determine a

Figure 11. Plot of Britain's Relative Trade with Britain's Relative Labor Productivity 1950-1989

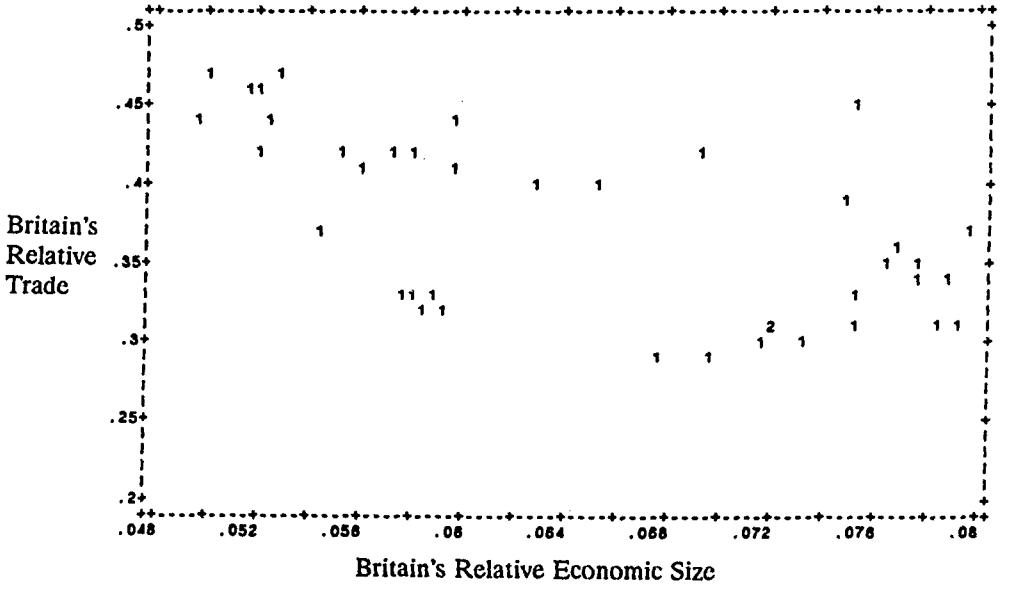

Figure 12. Plot of Britain's Relative Trade with Britain's Relative Economic Size 1950-1989

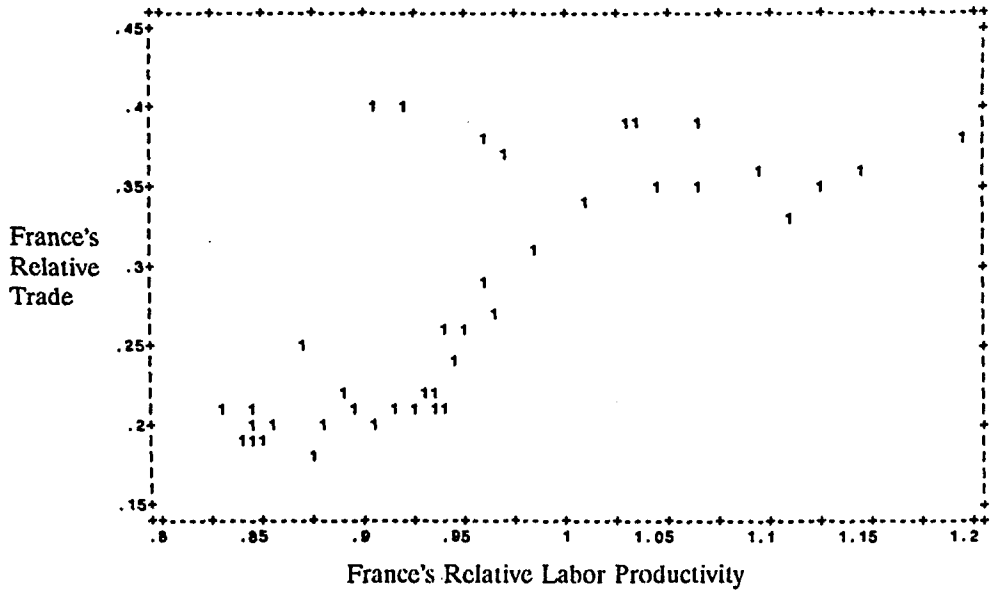

Figure 13. Plot of France's Relative Trade with France's Relative Labor Productivity 1950-1989

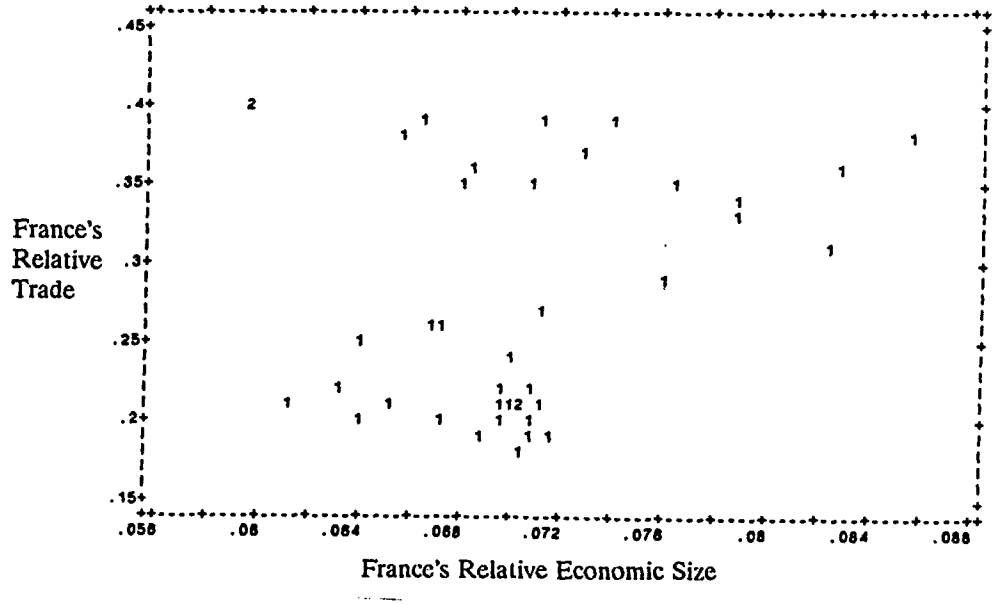

Figure 14. Plot of France's Relative Trade with France's Relative Economic Size 1950-1989

direction in the relationship between France's Relative Economic Size and Relative Trade. Therefore, the test for H_{2b} is also inconclusive.

Figures 15 and 16 show some interesting patterns for Japan. Although the "tightness" of the pattern suggests a strong relationship, the data for Japan reveals a pattern which exceeds the directions of the relationship hypothesized by H_{2a} and H_{2b}. For both Relative Labor Productivity and Relative Economic Size a pattern is revealed in which two bends are present. As the independent variables move from lower to higher levels, Relative Trade declines, then rises, and then declines once again. Thus, it is clear that at least in the case of Japan, there is a point at which the highest levels of Relative Labor Productivity and Relative Economic Size are associated with declining levels of Relative Trade. As was mentioned earlier in this chapter, Japan's patterns for the relationship between these variables should not be attributed to inevitable waves or cycles. Rather, it should be assumed that in Japan's case, when both Relative Labor Productivity and Relative Economic Size are at their highest levels, they are accompanied by an exogenous structural shift which results in declining levels of Japan's Relative Trade. Although it should not be assumed that H_{2a} and H_{2b} are falsified in the case for Japan, it can be concluded that factors unique to Japan are affecting the relationship between the two variables.

In light of the theoretical premise presented earlier which hypothesizes a U-shaped pattern, perhaps the most direct theoretical explanation would involve a reintroduction of the optimal tariff. In this manner, it may be possible that at the highest levels of relative international economic power, further economic gains could

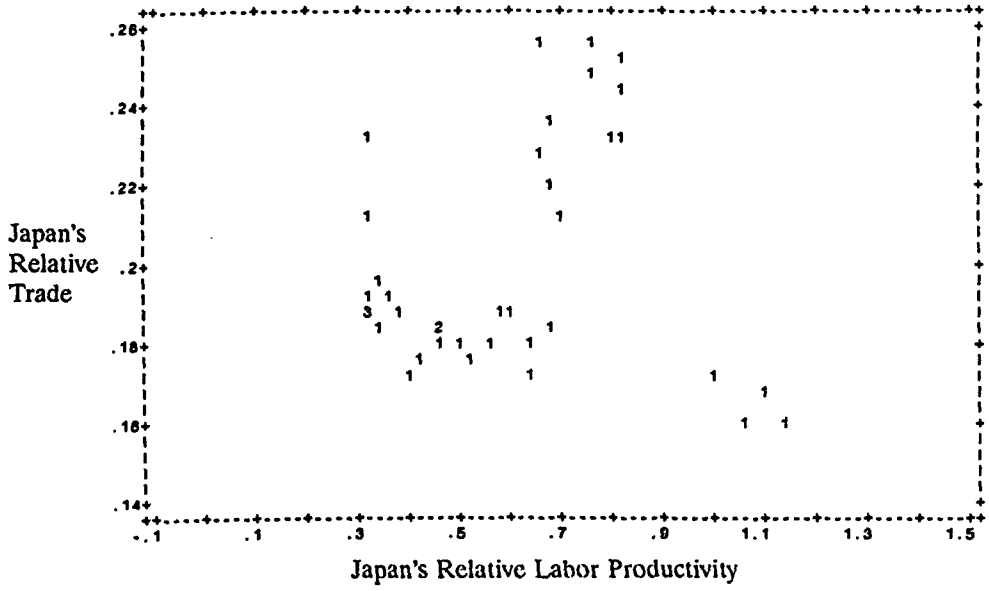

Figure 15. Plot of Japan's Relative Trade with Japan's Relative Labor Productivity 1952-1989

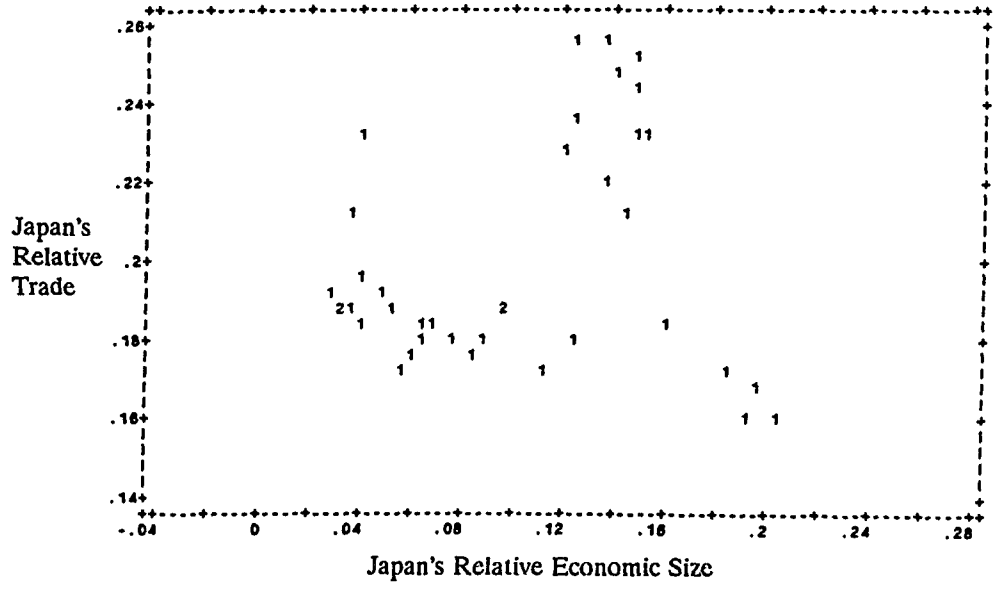

Figure 16. Plot of Japan's Relative Trade with Japan's Relative Economic Size 1952-1989

be secured by imposing an optimal tariff in a manner that would not seriously diminish important political relationships with trading partners. Nevertheless, a definitive explanation for this finding would not only require the introduction of Japanese economic policy as an additional independent variable, but it would also require an expansion of existing political economy theory. Both of these necessities would require research beyond this dissertation.

The plots presented in Figures 9-16 in general are difficult to interpret. In Figures 9 and 10, the different variances in the pooled data make a conclusive interpretation difficult. However, a U-shaped pattern is discernable. Britain, in Figures 11 and 12, supported the hypotheses, but the plots for France in Figures 13 and 14 were inconclusive in their support for the hypotheses. Finally, Japan's plots in Figures 15 and 16 produced an unanticipated pattern which resulted in inconclusive tests of the hypotheses.

Relative Trade and Measures of Domestic Regulatory Capacity

Figures 17-24 are presented as a means of testing H_3 concerning the direction of the relationship between the domestic regulatory capacity of Britain, France, and Japan and the Relative Trade of these countries. The figures illustrate the two measures chosen as valid indicators of domestic regulatory capacity. The two operational versions of H_3 are expressed as:

H_{3a}: Low levels of the Infrastructural Power of Britain, France, and Japan will be positively related to the Relative Trade of these countries, and high levels of

their Infrastructural Power will be negatively related to the Relative Trade of these counties.

H_{3b}: Low levels of the Relative Domestic Transfer Payments of Britain, France, and Japan will be positively related to the Relative Trade of these countries, and high levels of their Relative Domestic Transfer Payments will be negatively related to the Relative Trade of these counties.

Figures 17-24 present two variables which operationalize the concept of domestic regulatory capacity. These variables are Infrastructural Power and Relative Domestic Transfer Payments. These variables produce an essentially ∩-shaped pattern when plotted with Relative Trade.

Figures 17 and 18 are difficult to interpret because they depict a pooling of Britain, France, and Japan. The different variances for each of the three countries tend to mask the pattern produced by each country. Nevertheless, it is possible to locate characteristics of a ∩-shape in both of the plots. Given the lack of uniformity resulting from pooling the data, it can still be concluded that Figures 17 and 18 fail to falsify H_{3a} and H_{3b} respectively.

Figures 19 and 20 present Infrastructural Power and Relative Domestic Transfer Payments for Britain plotted against Britain's Relative Trade. The first plot in Figure 19 depicts a ∩-shaped pattern when Infrastructural Power is plotted with Relative Trade. Although the relationship seems weak at lower measures of Infrastructural Power, a ∩-shaped pattern is present nevertheless, thereby failing to falsify H_{3a}. However, this is not so clear for Britain's Relative Domestic Transfer

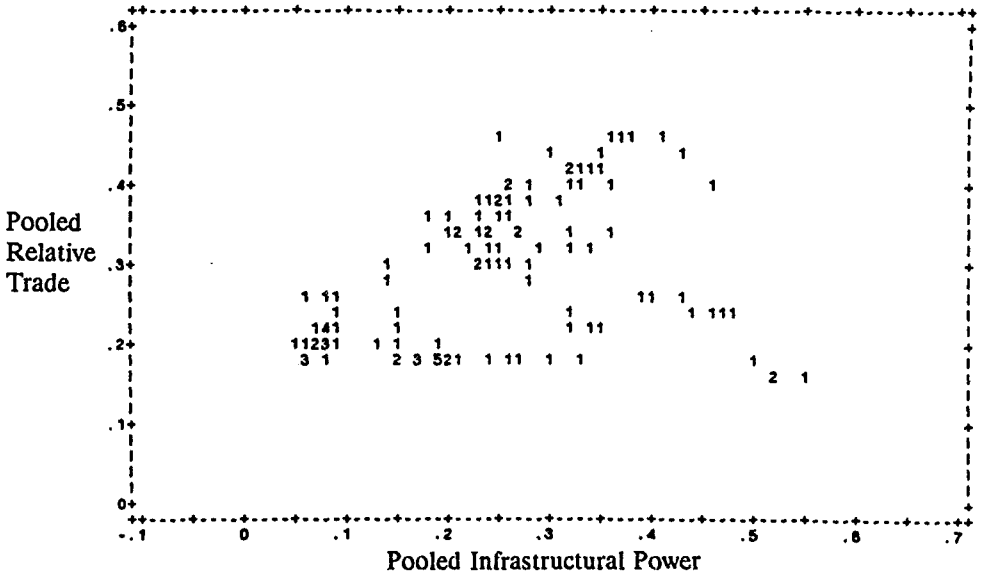

Figure 17. Plot of Pooled Relative Trade with Pooled Infrastructural Power 1950-1989[a]

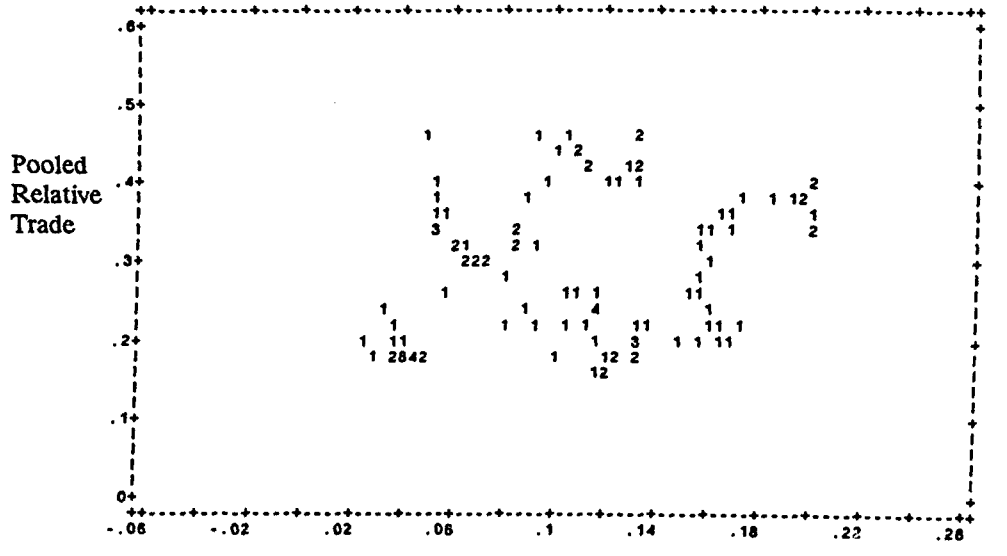

Figure 18. Plot of Pooled Relative Trade with Pooled Relative Domestic Transfer Payments 1950-1989[a]

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[a]Data for Japan begins in 1952.

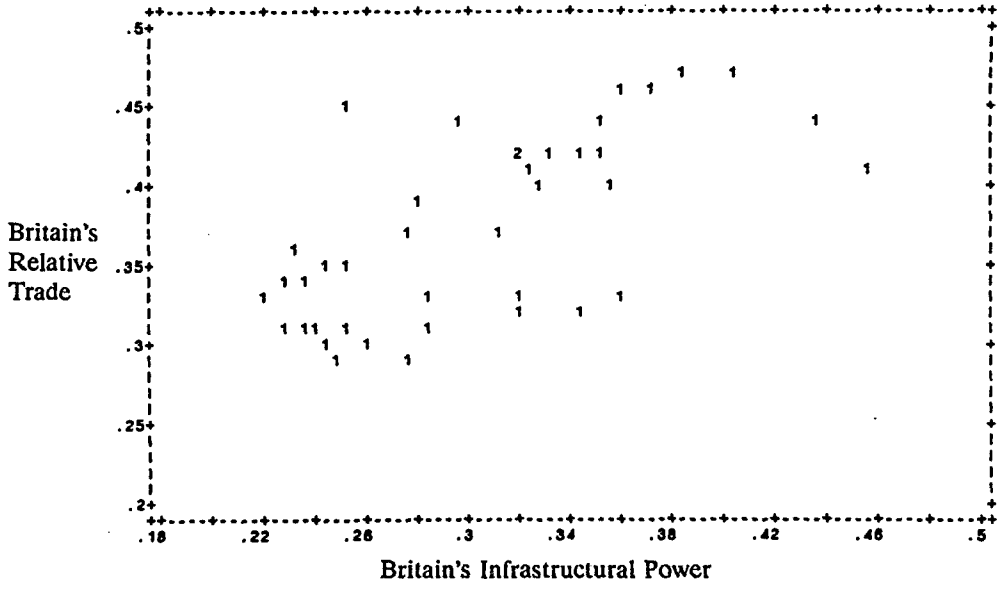

Figure 19. Plot of Britain's Relative Trade with Britain's Infrastructural Power 1950-1989

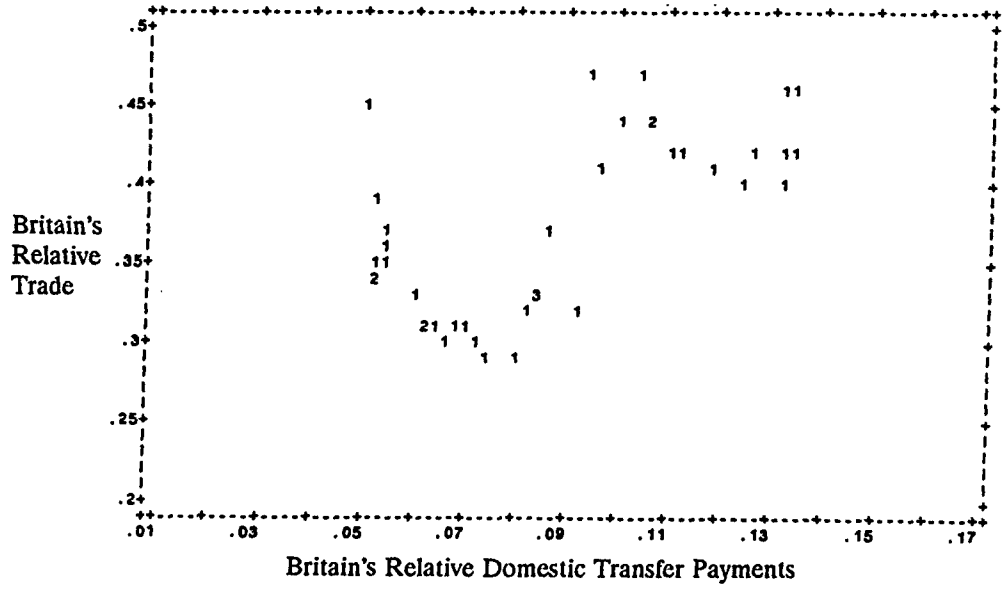

Figure 20. Plot of Britain's Relative Trade with Britain's Relative Domestic Transfer Payments 1950-1989

Payments presented in Figure 20. For this latter variable, the relationship is curvilinear, although not clearly in the pattern hypothesized. Thus, in the case of Britain, Infrastructural Power fails to falsify H_{3a}, while Relative Domestic Transfer Payments produces inconclusive results with respect to H_{3b}.

Figures 21 and 22 show that in the case of France, it is only at the highest measures of Infrastructural Power and Relative Domestic Transfer Payments that the relationship with Relative Trade becomes negative. Although only a few plot points indicate a negative relationship, the pattern would lead one to conclude that even higher measures of the independent variable would be associated with further declines in Relative Trade. Therefore, it can be concluded that H_{3a} and H_{3b} are supported by the plots for France presented in Figures 21 and 22.

Figures 23 and 24 show that once again (as in Figure 16), Japan presents an unanticipated pattern. Concerning the second plot in Figure 24 involving Relative Domestic Transfer Payments, although the pattern is not very strong, it nevertheless possesses an essential ∩-shape. Therefore, it can be concluded that Figure 24 fails to falsify H_{3b}. However, the first plot in Figure 23 depicts Infrastructural Power possessing two bends in its pattern. The "tightness" of the pattern indicates that Infrastructural Power is strongly related to Relative Trade, although in a manner that was not anticipated. At the lowest measures of Japan's Infrastructural Power, an unhypothesized negative relationship is revealed with Japan's Relative Trade. Since some of the data points produce a pattern which supports H_{3a}, rather than

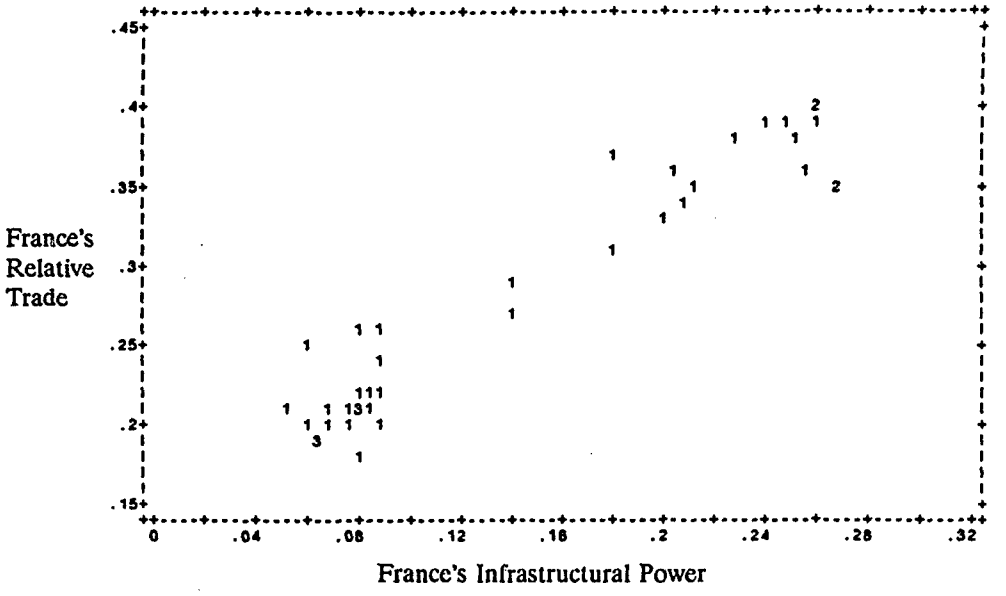

Figure 21. Plot of France's Relative Trade with France's Infrastructural Power 1950-1989

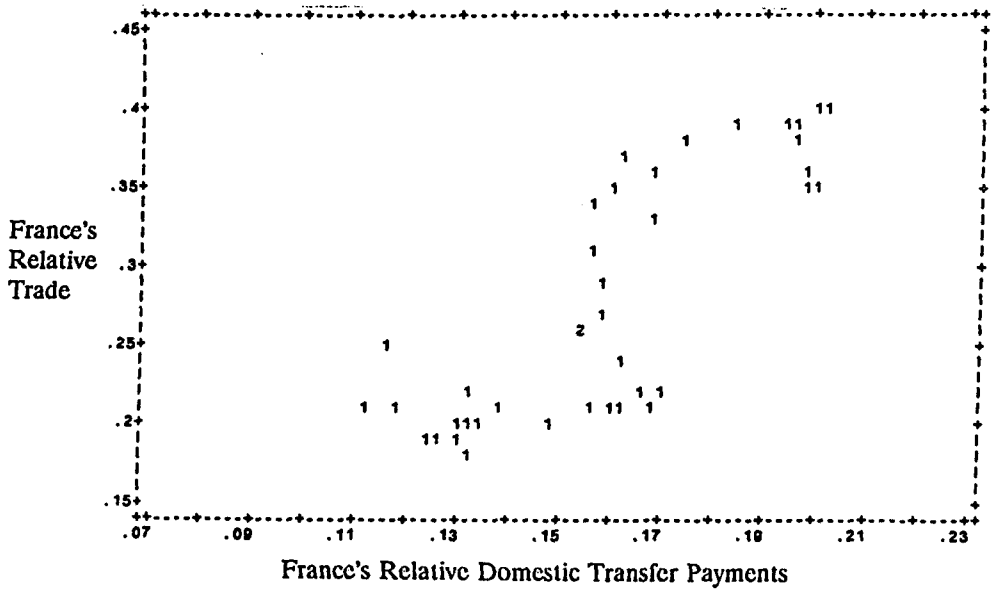

Figure 22. Plot of France's Relative Trade with France's Relative Domestic Transfer Payments 1950-1989

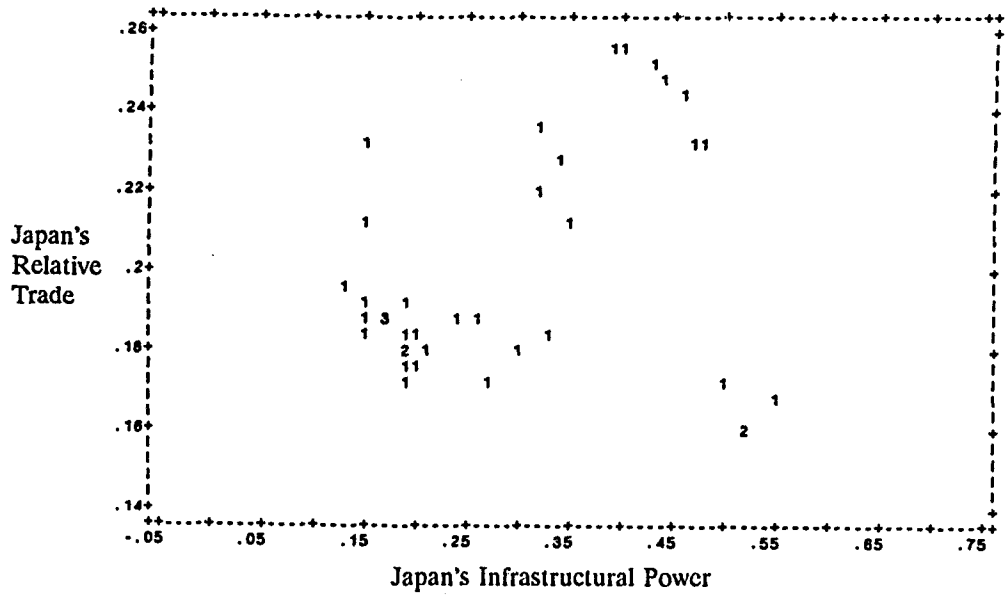

Figure 23. Plot of Japan's Relative Trade with Japan's Infrastructural Power 1952-1989

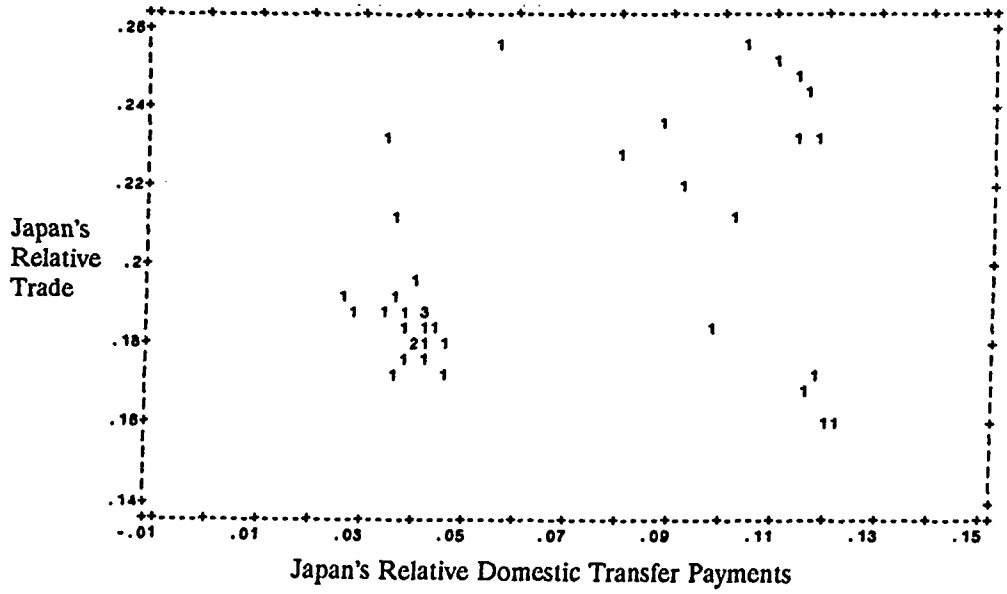

Figure 24. Plot of Japan's Relative Trade with Japan's Relative Domestic Transfer Payments 1952-1989

negating the hypothesis outright, it is preferable to declare the test to be inconclusive.

In general, it can be concluded that Figures 17-24 lend more support for H_{3a} than for H_{3b}. In short, Infrastructural Power produces a more definable ∩-shape than does Relative Domestic Transfer Payments. Additionally, once again the data for Japan produces a pattern which exceeds the direction of the hypothesized relationships presented earlier.

Research Methods

In order to test the significance of the relationship between the dependent and independent variables, a structural regression model was constructed that would support a linear time-series analysis. In order to do this, the curvilinear nature of the relationship between the dependent and independent variables must first be transformed so that linear regression can be conducted. Both the ∪-shaped and ∩-shaped patterns can be linearized through a polynomial transformation. In other words, the square of each of the independent variables is added to the regression model. The theoretical model presented earlier:

$$\text{Rel Trade}_t = \beta_0 + \beta_1 \text{ US Econ Heg}_t + \beta_2 \text{ Rel Int'l Econ Power}_t + \beta_3 \text{ Dom Reg Capacity}_t,$$

after undergoing a polynomial transformation becomes:

$$\text{Rel Trade}_t = \beta_0 + \beta_1 \text{ US Econ Heg}_t + \beta_2 (\text{US Econ Heg})^2_t + \beta_3 \text{ Rel Int'l Econ Power}_t + \beta_4 (\text{Rel Int'l Econ Power})^2_t + \beta_5 \text{ Dom Reg Capacity}_t + \beta_6 (\text{Dom Reg Capacity})^2_t.$$

The model was slightly altered when data from Japan was used in the analysis. As was shown earlier in the case of Japan in Figures 8.1, 8.2, and 12.1, when Relative Labor Productivity and Relative Economic Size were used as operational measures of Japan's relative international economic power, and when Infrastructural Power was used as an operational measure for Japan's domestic regulatory capacity, they all produced a double bended curve when plotted with Relative Trade. For these three independent variables, Relative Trade declined at low levels of the independent variables, increased at moderate levels, and then declined again at high levels of the independent variable. Such a pattern can be linearly transformed by a third order polynomial. In other words, both the square and cube of these variables are added to the regression model. Thus, whenever Japan is being analyzed by itself, or when the Japan data is pooled with Britain and France, in order for the regression model to capture the unique pattern produced by the Japanese data, the following model is employed:

$$\text{Rel Trade}_t = \beta_0 + \beta_1 \text{ US Econ Heg}_t + \beta_2 (\text{US Econ Heg})^2_t + \beta_3 \text{ Rel Int'l Econ Power}_t + \beta_4 (\text{Rel Int'l Econ Power})^2_t + \beta_5 (\text{Rel Int'l Econ Power})^3_t + \beta_6 \text{ Dom Reg Capacity}_t + \beta_7 (\text{Dom Reg Capacity})^2_t + \beta_8 (\text{Dom Reg Capacity})^3_t$$

Selecting the Operational Variables to Test the Model

Thus far, three different factors have been isolated as possible explanations for changes in the Relative Trade of Britain, France, and Japan. These factors are U.S. economic hegemony, the relative international economic power of Britain, France, and Japan, and the domestic regulatory capacity of these three countries. These factors have been operationalized by constructing two different indicators for each of the three factors. Thus, U.S. Relative Labor Productivity and U.S. Relative Economic Size are employed as distinct measures of U.S. economic hegemony. The Relative Labor Productivity and Relative Economic Size of Britain, France, and Japan are considered to be measures of the relative international economic power of these countries. Finally, Infrastructural Power and Relative Domestic Transfer Payments are used as measures of the domestic regulatory capacity of Britain, France, and Japan.

These six measures, when used to construct a regression model composed of three independent variables, can be organized into eight different combinations. Although it is possible to construct eight unique models, not all of the possible combinations make theoretical sense. Notice that both U.S. economic hegemony and the relative international economic power of Britain, France, and Japan are operationalized by Relative Labor Productivity and Relative Economic Size. This is because it is assumed that there is no fundamental difference between the two factors. That is, U.S. economic hegemony and the relative international economic power of Britain, France, and Japan are essentially the same type of factor. The

difference between the two is theoretical rather than operational. For example, as was discussed earlier, some scholars theorize that the extreme differences between U.S. economic power and the economic power of the rest of the world has a predictable effect on world trade. Additionally, some scholars have claimed that the international trade of any country will be influenced by the relative economic power of that country. Thus, it is assumed that U.S. relative economic power (i.e., U.S. economic hegemony) influences the trade of other countries and the relative international economic power of each of these other countries influences their own trade. Both are measures of relative international economic power. However, a theoretical distinction is imposed between U.S. economic power and the economic power of other countries.

In this light, it would not make much sense for a regression model to contain one operational measure for U.S. economic hegemony and a different operational measure for the relative international economic power of Britain, France, and Japan. Therefore, whenever Relative Labor Productivity is used to measure U.S. economic hegemony, it will also be used to measure the relative international economic power of Britain, France, and Japan. This will hold true for the variable Relative Economic Size as well. Given this condition, it is now possible to construct only four possible model combinations. Without bothering to show the appropriate linear transformations or distinguishing between pooled and isolated countries, the models are:

Model 1: Relative Trade = U.S. Relative Labor Productivity + B,F,J Relative Labor Productivity + B,F,J Infrastructural Power.

Model 2: Relative Trade = U.S. Relative Labor Productivity + B,F,J Relative Labor Productivity + B,F,J Relative Domestic Transfer Payments.

Model 3: Relative Trade = U.S. Relative Economic Size + B,F,J Relative Economic Size + B,F,J Infrastructural Power.

Model 4: Relative Trade = U.S. Relative Economic Size + B,F,J Relative Economic Size + B,F,J Relative Domestic Transfer Payments.

These models were tested with both pooled data and the isolated data for each country. When the data from the three countries was pooled, it produced an N of 118 (Japan was missing data for 1950 & 1951). When the countries were examined separately, the N was 40 (38 for Japan).

Correcting for Linear Transformation Problems

Two problems arise whenever a curvilinear relationship is linearized by means of a polynomial transformation (Mendenhall and Sincich 1989, 344). First, the squaring and/or cubing of a variable can produce either extremely large or extremely small numbers. As a result, even when computers and statistical packages are used to conduct the analysis, it is often the case that the extremely large and/or small numbers are rounded in order to fit the decimal limitations of the statistical package. In this manner, rounding error is unavoidable. The second problem is created by the inherent multicollinearity that exists between a variable and the powers of the

same variable in the regression model. In other words, χ and χ^2 may be so highly correlated that it is impossible to determine the unique contribution that each is making in the regression model.

A common correction for these problems involves coding the independent variables (Mendenhall and Sincich 1989, 344). The most common method of coding is to transform the independent variables into standard deviation units before conducting the polynomial transformation. This was the procedure chosen for this analysis. Therefore, all the independent variables used in this study were first changed into standard deviation units, and then linearized by means of the appropriate polynomial transformation.

Heteroskedasticity, Autocorrelation, Multicollinearity, and Lags

The linear transformations of the independent variables resulted in an increase in the number of independent variables. Therefore, in addition to testing each country individually, the three countries were pooled in order to increase the number of cases. Although pooling provided an acceptable ratio between the number of independent variables and the number of cases, several additional corrections were needed. A pooled time-series regression analysis will inherently be plagued by both heteroskedasticity and autocorrelation. The residual processes produced by pooling and time-series will require some type of Generalized Least Squares technique in order to correct for these problems. The choice of Generalized Least Squares techniques was based on its ability to deal with the

following: 1) heteroskedasticity produced by the pooling of Britain, France, and Japan; 2) autocorrelation resulting from the time-series data; and 3) provide reliable parameter estimates when each country is examined separately. This last criteria is important because transforming the data by squaring and/or cubing increased the number of independent variables. For example, the most demanding model is Japan's which has only 38 cases and eight independent variable plus and intercept. Three different regression techniques were employed in order to determine which best met these criteria. The three regression techniques were the Cochrane-Orcutt procedure, Yeul-Walker (also called Prais-Winsten), Maximum Likelihood. These procedures were executed on SAS statistical systems software.

Analysis of the residuals revealed that both the pooled and individual country regression computations were being influenced by first order autocorrelation. Furthermore, the pooled regression analysis had the additional problem of heteroskedasticity. The first technique employed to correct these problems inserted a dummy variable for each country into the pooled models. This procedure has been referred to as the least squares dummy variable model (LSDV) and is a common approach to performing regression analysis with pooled data (Sayrs 1989, 26-31). The LSDV model assigns a dummy variable for each sample, thereby providing a different fixed intercept for each country. This eliminates the heteroskedasticity that was created by pooling the data.

After correcting for heteroskedasticity, autocorrelation was controled by transforming the data using the iterative Cochrane-Orcutt technique. This technique

is conducted by first obtaining Ordinary Least Squares parameter estimates of the model. The residuals produced by the model are then regressed on each other in order to determine the degree that $residual_t$ is correlated with $residual_{t-1}$. This information is then used to transform the data in a manner that reduces the correlation among the residuals. This procedure can be continued until there is no longer any correlation among the residuals. In this research, iterations were continued until the Durbin-Watson statistic could no longer be improved and it was no longer possible to further reduce the sum of squared errors.

The LSDV/Cochrane-Orcutt technique has the advantage of first correcting for heteroskedasticity and then allowing for the correction of autocorrelation. Lois Sayrs emphasizes the importance of first correcting for heteroskedasticity before attempting to correct for autocorrelation (Sayrs 1989, 19). When each country was examined separately, the iterative Cochrane-Orcutt procedure was employed. Although the Cochrane-Orcutt technique often performs as well as other techniques (see Ostrom 1990, 38) it has the disadvantage of loosing the first case during the data transformation.

The second statistical technique employed in this study was what SAS refers to as the Yeul-Walker technique (SAS Institute 1988, 176-180). This procedure produces Prais-Winsten parameter estimates. The advantage of this procedure is that it incorporates the first observation that was lost when the Cochrane-Orcutt technique is used. However, this technique employs a single autoregressive process to correct for both heteroskedasticity and autocorrelation. If the heteroskedasticity

is not too severe, then this technique would be adequate. In the face of more serious heteroskedasticity, like that which might result from pooling samples, then the technique may not perform very well.

Maximum Likelihood estimation was the third technique explored for this analysis. Although Maximum Likelihood is not inherently more efficient than the other techniques, it does a better job of handling data from samples in which the distribution is non-normal (Sayrs 1989, 57). In other techniques this would result in biased estimates. Because pooling samples increases the possibility of incorporating biased data, Maximum Likelihood was employed for both the pooled and individual country models.

Each of these three techniques were used to analyze the four pooled models presented earlier. The Yeul-Walker and Maximum Likelihood techniques produced higher R^2s that the LSDV/Cochrane-Orcutt technique. However, the LSDV/Cochrane-Orcutt technique was more successful at minimizing the sum of squared errors, producing statistically significant estimates, and giving the highest Durbin Watson statistic. Therefore, the LSDV/Cochrane-Orcutt technique was chosen as the best performing technique. When each country was examined separately, in all but two of the French models the Cochrane-Orcutt technique out performed the Maximum Likelihood and Yeul-Walker techniques by minimizing the sum of squared errors and producing the highest Durbin Watson statistic. Therefore, the LSDV/Cochrane-Orcutt results are reported in this study for both the pooled and individual country models.

Diagnostics of the regression analysis for each of the three countries revealed that heteroskedasticity was not a problem and that the Cochrane-Orcutt technique successfully controlled for autocorrelation. A test of first and second moment specification was conducted in order to determine if any heteroskedasticity remained in the residuals. This test produces both a regular covariance matrix and an heteroskedasticity consistent covariance matrix such as might be used to conduct generalized least squares. A Chi squared statistic is then calculated in order to measure the difference between the two matrices. If the two matrices produce a low Chi-squared value, then it can be concluded that heteroskedasticity is not a significant problem. This test was performed on all the regression models. At no time did the Chi-squared statistic indicate a serious presence of heteroskedasticity.

An examination of the variance inflation factors (VIF) was used in order to determine if multicollinearity was a problem. The diagonal elements of an inverse correlation matrix are used to calculate the variance inflation factor for each variable in the model. Peter Kennedy (1992, 183) suggests that as a rule of thumb, a VIF_i greater than ten for a particular variable indicates harmful collinearity. The only time that variance inflation factors exceeded ten was when Japan was examined by itself. (See Appendix C, pages 166-182). The high VIFs resulted from the necessity of both squaring and cubing two of the independent variables in order to adequately conduct the linear transformation for the Japanese models. In spite of the high variance inflation factors for Japan, the results for Japan presented in the next chapter are reliable. As will be shown in the next chapter, the high multicollinearity

for Japan is created by the third order polynomial transformations. Multicollinearity is not a problem among the independent variables before they are transformed. Thus, although multicollinearity makes it difficult to determine the significance of each power transformation, it does not prevent determining the significance of the contribution made by the independent variables given their polynomial transformation. This point will be clarified in the next chapter.

Finally, the models are constructed in a manner that assumes a real time relationship between the dependent and independent variables. It is often the case with econometric modeling that the independent variables are lagged in order to compensate for a delay between the independent cause and the dependent result. However, with reference to this research question, it was not believed that lagging the independent variables was necessary. The theory supporting these models is focused on measurable outcomes. For example, assuming the efficiency of domestic and international markets, changes in a country's Relative Labor Productivity should have an almost immediate effect on the international competitiveness of its trade goods. On the other hand, an example for which lagging might be more appropriate would involve an independent variable such as economic policy or interest group pressure. In this case, it would seem reasonable to hypothesize a lag in order to compensate for the inevitable delay between policy formulation, implementation, and measurable results. Although lagging was not called for in this research, because employing some type of lag in the independent variables is so common with econometric modeling, it seemed prudent to test the models with various lags in

order to validate the theoretical assumption that a real time relationship is the most appropriate. Regression analyses were conducted using both fixed and distributed time lags of the independent variables at 1, 3, and 5 year intervals. At no time did any of these tests produce improved parameter estimates or higher R^2s.

CHAPTER FOUR:

RESULTS

The purpose of this research is to determine whether or not changes in the Relative Trade of Britain, France, and Japan from 1950 to 1989 can be significantly accounted for by changes in three factors: U.S. economic hegemony, the relative international economic power of Britain, France, and Japan, and the domestic regulatory capacity of Britain, France, and Japan. In order to test this, each of these three factors were operationalized in two different ways. Assuming that each of the operationalized measures is a valid indicator of the previously mentioned three factors, four regression models were constructed in order to test the significance of the linear relationship between the dependent and independent variables. Finally, each independent variable needed to be linearized by means of a polynomial transformation in preparation for least squares regression.

Tables 1-16 present the results of a time-series regression analysis of each of the four operationalized models. Each model is tested using the pooled data from Britain, France, and Japan, and examining each country separately. Each table is accompanied by plots of the residuals. (See Figures B.1 through B.16 in Appendix B, pages 150-166). These can be used to visually check for heteroskedasticity and autocorrelation. Each table is also accompanied by additional data printouts which

include variance inflation factors and first and second moment tests for heteroskedasticity. (See Appendix C, pages 167-183). Tables 1-4 present the findings for the first operational model composed of the independent variables U.S. Relative Labor Productivity (US RLP), the Relative Labor Productivity (RLP) of Britain, France, and Japan, and the Infrastructural Power (INFPOW) of Britain, France, and Japan. Table 1 presents the findings when Britain, France, and Japan are pooled. The model is formally expressed as:

$$\text{Pooled Rel Trade}_t = \beta_0 D_{\text{Britain}} + \beta_0 D_{\text{France}} + \beta_0 D_{\text{Japan}} + \beta_1 \text{US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{Pooled RLP}_t + \beta_4 (\text{Pooled RLP})^2_t + \beta_5 (\text{Pooled RLP})^3_t + \beta_6 \text{Pooled INFPOW}_t + \beta_7 (\text{Pooled INFPOW})^2_t + \beta_8 (\text{Pooled INFPOW})^3_t$$

The first three variables in the model are dummy variables which serve no explanatory function, but simply provide a unique fixed intercept for the data from each country. The use of dummy variables in this manner minimized the inherent heteroskedasticity that results when the data from different samples are pooled. A visual presentation of the residuals showed no serious contamination by heteroskedasticity. (See Figure B.1 in Appendix B, page 151). The variance inflation factors for all the variables were greater than ten, so multicollinearity was not a problem. (See Appendix C, page 168).

The remaining independent variables are a linear transformation of the data provided by each of the operationalized variables. However, the statistical significance of each polynomial transformation reveals only whether or not the transformation was useful in the regression model. The polynomial transformations

themselves provide no explanatory or interpretive contribution. Of more importance is the contribution made by the combination of polynomial transformations for each operational variable. For example, it is more important to determine if the entire linear contribution (i.e., the functional form) of US RLP is significantly related to Relative Trade rather than explaining or interpreting the individual significance of US RLP and (US RLP)^2.

A hypothesis can be constructed to test the statistical significance of the functional form of each of the remaining independent variables. In addition to being squared, pooled RLP and pooled INFPOW are cubed. This is done in order to capture the Japanese data for these variables which, as shown in the previous chapter in Figures 15 and 23, possess a third order bend in the relationship. Without including these cubed variables, the data in the additional bends would be neglected. Therefore, concerning the functional form of these independent variables, the following hypotheses can be constructed in order to test $\underline{F}_{.05}$:

U.S. Relative Labor Productivity:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.07$

Pooled Relative Labor Productivity:

H_{0b}: $\beta_3 = \beta_4 = \beta_5 = 0$ H_{1b}: $\beta_3 = \beta_4 = \beta_5 > 0$ $\underline{F}_{.05} = 2.68$

Pooled Infrastructural Power:

H_{0c}: $\beta_6 = \beta_7 = \beta_8 = 0$ H_{1c}: $\beta_6 = \beta_7 = \beta_8 > 0$ $\underline{F}_{.05} = 2.68$

Table 1 shows that the functional form of all three independent variables are statistically significant beyond the .05 level. Therefore, for each of the functional

forms of the independent variables, the null hypothesis is rejected and the research hypothesis is accepted. The strength of this model is bolstered by the size of the $\underline{F}$ ratio for each functional form. All three functional forms are significant beyond the .01 level, with U.S. Relative Labor Productivity and Pooled Infrastructural Power being significant beyond the .0001 level. After correcting for the contribution made by the dummy variables, the model produces an adjusted partial $\underline{R}^2$ of .40. In other words, the independent variables can statistically account for 40% of the variance in pooled Relative Trade.

Tables 2-4 show the results from using U.S. Relative Labor Productivity, Relative Labor Productivity, and Infrastructural Power to account for the individual Relative Trade of Britain, France, and Japan. In the case of Britain, the operational regression model is formally expressed as:

$$\text{Britain's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ Britain's RLP}_t +$$

$$\beta_4 (\text{Britain's RLP})^2_t + \beta_5 \text{ Britain's INFPOW}_t + \beta_6 (\text{Britain's INFPOW})^2_t$$

The statistical significance of each independent variable in its functional form can be tested according to the following hypotheses:

U.S. Relative Labor Productivity:

H_{0a}: $\beta_1 = \beta_2 = 0$ $\quad H_{1a}$: $\beta_1 = \beta_2 > 0$ $\quad \underline{F}_{.05} = 3.23$

Britain's Relative Labor Productivity:

H_{0b}: $\beta_3 = \beta_4 = 0$ $\quad H_{1b}$: $\beta_3 = \beta_4 > 0$ $\quad \underline{F}_{.05} = 3.23$

Britain's Infrastructural Power:

H_{0c}: $\beta_5 = \beta_6 = 0$ $\quad H_{1c}$: $\beta_5 = \beta_6 > 0$ $\quad \underline{F}_{.05} = 3.23$

Table 2 shows that the $\underline{F}$ ratios for the functional form of U.S. Relative Labor Productivity and Britain's Relative Labor Productivity are significant beyond the .05 level. Therefore, the null hypothesis is rejected for these two functional forms. However, the functional form of Britain's Infrastructural Power is not significant at the .05 level, and therefore, the null hypothesis cannot be rejected. An adjusted $\underline{R}^2$ of .30 is low relative to those produced by most of the other models in this study. Because multicollinearity is not a serious problem in this particular model (see Appendix C, page 169), it must be concluded that the low $\underline{F}$ ratio for the functional form of Britain's Infrastructural Power is due to a lack of fit.

Table 3 gives the results for the same model applied to France. The model and hypotheses are identical to those used for Britain.

$$\text{France's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ France's RLP}_t + \beta_4 (\text{France's RLP})^2_t + \beta_5 \text{ France's INFPOW}_t + \beta_6 (\text{France's INFPOW})^2_t$$

The statistical significance of each independent variable in its functional form can be tested according to the following hypotheses:

U.S. Relative Labor Productivity:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.23$

France's Relative Labor Productivity:

H_{0b}: $\beta_3 = \beta_4 = 0$ H_{1b}: $\beta_3 = \beta_4 > 0$ $\underline{F}_{.05} = 3.23$

France's Infrastructural Power:

H_{0c}: $\beta_5 = \beta_6 = 0$ H_{1c}: $\beta_5 = \beta_6 > 0$ $\underline{F}_{.05} = 3.23$

Table 1. Model One of Britain, France, & Japan Pooled, 1950 - 1989[a]
Standardized LSDV / Cochrane-Orcutt Results
Dependent = Pooled Relative Trade

Independent Variables	Beta[b]	Std. Error	t Ratio	Prob>t[c]	F Ratio	Prob>F
(US RLP)	-.0317	.0080	-3.977	.0001		
(US RLP)^2	.0112	.0064	1.745	.0839		
Functional Form of US Relative Labor Productivity					11.39	.0001
(Pooled RLP)	-.0206	.0107	-1.917	.0580		
(Pooled RLP)^2	-.0029	.0054	-0.541	.5897		
(Pooled RLP)^3	-.0009	.0002	-0.368	.7136		
Functional Form of Pooled Relative Labor Productivity					4.88	.0032
(Pooled INFPOW)	.0555	.0095	5.869	.0001		
(Pooled INFPOW)^2	.0227	.0059	3.836	.0002		
(Pooled INFPOW)^3	-.0169	.0028	-5.949	.0001		
Functional Form of Pooled Infrastructural Power					15.89	.0001
Number of cases = 118	Durbin-Watson = 2.07					
Partial R^2 = .44[d]	Adjusted Partial R^2 = .40					

[a]Data for Japan begins in 1952.

[b]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[c]Two-tailed test.

[d]A dummy variable for each country was inserted into the pooled model in order to correct for the inherent heteroskedasticity that results when samples are pooled. The Partial R^2 represents the percentage of the R^2 that was not accounted for by the dummy variables.

Table 2. Model One of Britain, 1950 - 1989
Standardized Cochrane-Orcutt Results
Dependent = Britain Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.1095	.0062	17.72	.0001		
(US RLP)	.0244	.0167	1.466	.1520		
(US RLP)^2	.0361	.0119	3.032	.0048		
Functional Form of US Relative Labor Productivity					4.71	.0162
(Britain RLP)	-.0613	.0282	2.173	.0372		
(Britain RLP)^2	-.0063	.0153	0.412	.6820		
Functional Form of Britain Relative Labor Productivity					4.12	.0256
(Britain INFPOW)	.0150	.0135	1.140	.2623		
(Britain INFPOW)^2	-.0008	.0057	0.141	.8876		
Functional Form of Britain Infrastructural Power					0.83	.4441
Number of cases = 40	Durbin-Watson = 1.87					
R^2 = .41	Adjusted R^2 = .30					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

Table 3. Model One of France, 1950 - 1989
Standardized Cochrane-Orcutt Results
Dependent = France Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.1881	.0087	21.55	.0001		
(US RLP)	-.0216	.0142	-1.520	.1380		
(US RLP)^2	.0077	.0069	1.108	.2757		
Functional Form of US Relative Labor Productivity					1.36	.2698
(France RLP)	-.0144	.0147	-0.977	.3357		
(France RLP)^2	-.0006	.0053	-0.112	.9119		
Functional Form of France Relative Labor Productivity					1.12	.3385
(France INFPOW)	.0716	.0125	5.714	.0001		
(France INFPOW)^2	-.0064	.0111	-0.582	.5643		
Functional Form of France Infrastructural Power					31.66	.0001
Number of cases = 40	Durbin-Watson = 1.93					
R^2 = .88	Adjusted R^2 = .86					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

Table 3 shows that the functional forms of both U.S. Relative Labor Productivity and France's Relative Labor Productivity fail to be significant at the .05 level. However, the functional form of France's Infrastructural Power is highly significant, well beyond the .05 level. The model produces an adjusted $\underline{R}^2$ of .86, almost all of which is the result of France's Infrastructural Power. Although the model is plagued by some multicollinearity (see Appendix C, page 170), it primarily results from each variable and its square rather than from a linear relationship among two or more of the functional forms. In short, it can be concluded that given this model, almost all of the .86 adjusted $\underline{R}^2$ can be accounted for by changes in the domestic component of the model, i.e., France's Infrastructural Power.

Table 4 shows the results after the model is adapted for Japan. Earlier it was revealed that in the case of Japan, a double bent curve is produced when Japan's Relative Trade is plotted separately against Japan's Relative Labor Productivity and Japan's Infrastructural Power. Therefore, in the case of Japan, the regression model can be formally expressed as:

$$\text{Japan's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ Japan's RLP}_t + \beta_4 (\text{Japan's RLP})^2_t + \beta_5 (\text{Japan's RLP})^3_t + \beta_6 \text{ Japan's INFPOW}_t + \beta_7 (\text{Japan's INFPOW})^2_t + \beta_8 (\text{Japan's INFPOW})^3_t$$

Based on this model, the following hypotheses are constructed:

U.S. Relative Labor Productivity:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.25$

Japan's Relative Labor Productivity:

H_{0b}: $\beta_3 = \beta_4 = \beta_5 = 0$ H_{1b}: $\beta_3 = \beta_4 = \beta_5 > 0$ $\underline{F}_{.05} = 2.85$

Japan's Infrastructural Power:

H_{0c}: $\beta_6 = \beta_7 = \beta_8 = 0$ H_{1c}: $\beta_6 = \beta_7 = \beta_8 > 0$ $\underline{F}_{.05} = 2.85$

The results for Japan in Table 4 must be interpreted cautiously. An analysis of the variance inflation factors (VIF) reveals that the model possessed high levels of multicollinearity. (See Appendix C, page 171). Although most of the multicollinearity can be attributed to the squaring and/or cubing of the independent variables, even after being coded, some of the multicollinearity comes from a correlation between Japan's Relative Labor Productivity and Infrastructural Power. Although U.S. Relative Labor Productivity has a low $\underline{F}$ ratio, it is unlikely that multicollinearity is the cause. In order to determine whether or not multicollinearity was masking a statistically significant relationship between US RLP and Japan's Relative Trade, a secondary model was tested in which Japan's Relative Trade was regressed on only US RLP and (US RLP)^2. Even when U.S. Relative Labor Productivity is used as the only variable in the model, it did not produce a significant $\underline{F}$ ratio. Therefore, almost all of the adjusted $\underline{R}^2$ of .65 is produced by the functional forms of Japan's Relative Labor Productivity and Infrastructural Power. Given these considerations, it can be concluded that the null hypothesis H_{0a} cannot be rejected. However, the remaining two null hypotheses, H_{0b} and H_{0c}, can be rejected in favor of the research hypothesis for each.

Table 4. Model One of Japan, 1952 - 1989
Standardized Cochrane-Orcutt Results
Dependent = Japan Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.1604	.0086	18.735	.0001		
(US RLP)	-.0142	.0181	-0.786	.4386		
(US RLP)^2	.0072	.0102	0.703	.4876		
Functional Form of US Relative Labor Productivity					1.63	.2149
(Japan RLP)	-.0558	.0290	-1.920	.0651		
(Japan RLP)^2	-.0219	.0217	-1.005	.3233		
(Japan RLP)^3	.0041	.0080	0.508	.6154		
Functional Form of Japan Relative Labor Productivity					4.59	.0098
(Japan INFPOW)	.0750	.0186	4.034	.0004		
(Japan INFPOW)^2	.0305	.0142	2.148	.0405		
(Japan INFPOW)^3	-.0201	.0069	-2.890	.0074		
Functional Form of Japan Infrastructural Power					8.43	.0004
Number of cases = 38	Durbin-Watson = 1.79					
R^2 = .73	Adjusted R^2 = .65					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

Tables 5-8 present the results of a different operational model. In this second model, Infrastructural Power is removed and replaced by Relative Domestic Transfer Payments (DOMTRAN). Both variables are designed to be an indicator of a country's domestic regulatory capacity. Whereas Infrastructural Power is a measure of taxes relative to production, Relative Domestic Transfer Payments is a measure of government's social spending relative to production. Table 5 gives the results of Britain, France, and Japan pooled. Because Japan's data is part of the pool it is necessary to add (Pooled RLP)^3 and (Pooled DOMTRAN)^3 to the regression model. The model is formally expressed as:

$$\text{Pooled Rel Trade}_t = \beta_0 D_{\text{Britain}} + \beta_0 D_{\text{France}} + \beta_0 D_{\text{Japan}} + \beta_1 \text{US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{Pooled RLP}_t + \beta_4 (\text{Pooled RLP})^2_t + \beta_5 (\text{Pooled RLP})^3_t + \beta_6 \text{Pooled DOMTRAN}_t + \beta_7 (\text{Pooled DOMTRAN})^2_t + \beta_8 (\text{Pooled DOMTRAN})^3_t$$

Given this model, the statistical significance of the functional forms of each independent variable can be tested with the following hypotheses:

U.S. Relative Labor Productivity:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.07$

Pooled Relative Labor Productivity:

H_{0b}: $\beta_3 = \beta_4 = \beta_5 = 0$ H_{1b}: $\beta_3 = \beta_4 = \beta_5 > 0$ $\underline{F}_{.05} = 2.68$

Pooled Relative Domestic Transfer Payments:

H_{0c}: $\beta_6 = \beta_7 = \beta_8 = 0$ H_{1c}: $\beta_6 = \beta_7 = \beta_8 > 0$ $\underline{F}_{.05} = 2.68$

In general, Table 5 reveals that Relative Domestic Transfer Payments reduces the overall fit of the model. Pooled Relative Domestic Transfer Payments is the only functional form variable that is significant beyond the .05 level. The Pooled functional forms of U.S. Relative Labor Productivity and Pooled Relative Labor Productivity produce low $\underline{F}$ ratios which result in a failure to reject the null hypotheses for these variables. The variance inflation factors (VIF) indicate some multicollinearity between the functional forms of Pooled Relative Labor Productivity and Pooled Relative Domestic Transfer Payments, but these were not significant. (See Appendix C, page 172). Given that heteroskedasticity was not a problem (see Figure B.1 in Appendix B, page 155), multicollinearity cannot be the only explanation for the relatively low $\underline{F}$ ratios. Given that the model produces an adjusted $\underline{R}^2$ of only .26, it must be concluded that the low $\underline{F}$ ratios are simply the result of a less than impressive model fit.

Table 6 summarizes Britain's results when U.S. Relative Labor Productivity, Britain's Relative Labor Productivity, and Britain's Relative Domestic Transfer Payments are used as independent variables in the model. The model is formally expressed as:

$$\text{Britain's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ Britain's RLP}_t + \beta_4 (\text{Britain's RLP})^2_t + \beta_5 \text{ Britain's DOMTRAN}_t + \beta_6 (\text{Britain's DOMTRAN})^2_t$$

The statistical significance of each independent variable in its functional form can be tested according to the following hypotheses:

Table 5. Model Two of Britain, France, & Japan Pooled, 1950 - 1989[a]
Standardized LSDV / Cochrane-Orcutt Results
Dependent = Pooled Relative Trade

Independent Variables	Beta[b]	Std. Error	t Ratio	Prob>t[c]	F Ratio	Prob>F
(US RLP)	-.0131	.0127	-1.036	.3025		
(US RLP)^2	.0124	.0077	1.596	.1134		
Functional Form of US Relative Labor Productivity					2.70	.0719
(Pooled RLP)	-.0119	.0121	-0.985	.3268		
(Pooled RLP)^2	.0027	.0065	0.410	.6826		
(Pooled RLP)^3	-.0029	.0029	-0.993	.3231		
Functional Form of Pooled Relative Labor Productivity					2.29	.0825
(Pooled DOMTRAN)	.0407	.0185	2.204	.0297		
(Pooled DOMTRAN)^2	-.0110	.0088	-1.260	.2103		
(Pooled DOMTRAN)^3	-.0012	.0071	-0.169	.8662		
Functional Form of Pooled Domestic Transfers					3.57	.0166
Number of cases = 118	Durbin-Watson = 2.03					
Partial R^2 = .31[d]	Adjusted Partial R^2 = .26					

[a]Data for Japan begins in 1952.

[b]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[c]Two-tailed test.

[d]A dummy variable for each country was inserted into the pooled model in order to correct for the inherent heteroskedasticity that results when samples are pooled. The Partial R^2 represents the percentage of the R^2 that was not accounted for by the dummy variables.

Table 6. Model Two of Britain, 1950 - 1989
Standardized Cochrane-Orcutt Results
Dependent = Britain Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.0869	.0066	13.194	.0001		
(US RLP)	.0171	.0245	0.700	.4888		
(US RLP)^2	.0296	.0132	2.236	.0325		
Functional Form of US Relative Labor Productivity					2.59	.0905
(Britain RLP)	-.0667	.0286	-2.335	.0260		
(Britain RLP)^2	-.0074	.0138	-0.540	.5926		
Functional Form of Britain Relative Labor Productivity					3.01	.0633
(Britain DOMTRAN)	.0020	.0306	0.066	.9476		
(Britain DOMTRAN)^2	.0055	.0173	0.315	.7550		
Functional Form of Britain Domestic Transfers					0.09	.9180
Number of cases = 40	Durbin-Watson = 1.88					
R^2 = .34	Adjusted R^2 = .22					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

U.S. Relative Labor Productivity:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.23$

Britain's Relative Labor Productivity:

H_{0b}: $\beta_3 = \beta_4 = 0$ H_{1b}: $\beta_3 = \beta_4 > 0$ $\underline{F}_{.05} = 3.23$

Britain's Relative Domestic Transfer Payments:

H_{0c}: $\beta_5 = \beta_6 = 0$ H_{1c}: $\beta_5 = \beta_6 > 0$ $\underline{F}_{.05} = 3.23$

Table 6 reveals that none of the functional form variables are significant at the .05 level. Not only does the functional form of Relative Domestic Transfer Payments fail to be statistically significant, but the functional forms of U.S. Relative Labor Productivity and Britain's Relative Labor Productivity, which had been statistically significant back in Table 2, are no longer significant. In all instances, the null hypothesis fails to be rejected. Furthermore, an adjusted $\underline{R}^2$ of .22 is low relative to the other models. Heteroskedasticity was not serious (see Figure B.6 in Appendix B, page 156) and the variance inflation factors are low (see Appendix C, page 173). Therefore, it must be concluded that in the case of Britain, the inclusion of Relative Domestic Transfer Payments diminishes the overall fit of the model.

Table 7 presents the findings for France when it is analyzed in the same manner as Britain. As was the case with Britain, the model is formally expressed as:

$$\text{France's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ France's RLP}_t + \beta_4 (\text{France's RLP})^2_t + \beta_5 \text{ France's DOMTRAN}_t + \beta_6 (\text{France's DOMTRAN})^2_t$$

Table 7. Model Two of France, 1950 - 1989
Standardized Cochrane-Orcutt Results
Dependent = France Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.0735	.0059	12.394	.0001		
(US RLP)	-.0316	.0183	-1.732	.0926		
(US RLP)^2	.0192	.01178	1.632	.1122		
Functional Form of US Relative Labor Productivity					2.98	.0646
(France RLP)	-.0151	.0168	-0.895	.3775		
(France RLP)^2	-.0017	.0059	-0.029	.9767		
Functional Form of France Relative Labor Productivity					0.81	.4544
(France DOMTRAN)	.0491	.0160	3.075	.0042		
(France DOMTRAN)^2	.0052	.0109	0.479	.6351		
Functional Form of France Domestic Transfers					5.62	.0079
Number of cases = 40	Durbin-Watson = 1.89					
R^2 = .68	Adjusted R^2 = .62					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

The statistical significance of each independent variable in its functional form can be tested according to the following hypotheses:

U.S. Relative Labor Productivity:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.23$

France's Relative Labor Productivity:

H_{0b}: $\beta_3 = \beta_4 = 0$ H_{1b}: $\beta_3 = \beta_4 > 0$ $\underline{F}_{.05} = 3.23$

France's Relative Domestic Transfer Payments:

H_{0c}: $\beta_5 = \beta_6 = 0$ H_{1c}: $\beta_5 = \beta_6 > 0$ $\underline{F}_{.05} = 3.23$

An examination of the variance inflation factors (VIF) has revealed that the model is marginally contaminated by multicollinearity. However, the VIF for each variable is well below ten. (See Appendix C, page 174). As was the case with Table 3, the functional forms of both U.S. Relative Labor Productivity and France's Relative Labor Productivity fail to be statistically significant at the .05 level. This results in a failure to reject the null hypothesis for these two functional forms. On the other hand, the functional form of Relative Domestic Transfer Payments is significant beyond the .05 level, which allows for a rejection of H_{0c} and the acceptance of H_{1c}. However, the $\underline{F}$ ratio is low considering that the model produced an adjusted $\underline{R}^2$ of .62. The residual plots indicate some kind of pattern produced by the residuals. (See Figure B.7 in Appendix B, page 157). This detracts from the efficiency of the parameter estimates, thus making it difficult to attain statistical significance. In general, the relatively low $\underline{F}$ ratios for all the functional forms is partially due to multicollinearity between the functional forms.

Table 8 shows the results for Japan when U.S. Relative labor Productivity, Japan's Relative Labor Productivity, and Japan's Relative Domestic Transfer Payments are used as independent variables. As was the case in Table 4, Japan's variables required both squaring and cubing in order to be linearly transformed. The model is formally expressed as:

$$\text{Japan's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ Japan's RLP}_t + \beta_4 (\text{Japan's RLP})^2_t + \beta_5 (\text{Japan's RLP})^3_t + \beta_6 \text{ Japan's DOMTRAN}_t + \beta_7 (\text{Japan's DOMTRAN})^2_t + \beta_8 (\text{Japan's DOMTRAN})^3_t$$

Based on this model, the following hypotheses are constructed:

U.S. Relative Labor Productivity:

$H_{0a}: \beta_1 = \beta_2 = 0 \quad H_{1a}: \beta_1 = \beta_2 > 0 \quad \underline{F}_{.05} = 3.25$

Japan's Relative Labor Productivity:

$H_{0b}: \beta_3 = \beta_4 = \beta_5 = 0 \quad H_{1b}: \beta_3 = \beta_4 = \beta_5 > 0 \quad \underline{F}_{.05} = 2.85$

Japan's Relative Domestic Transfer Payments:

$H_{0c}: \beta_6 = \beta_7 = \beta_8 = 0 \quad H_{1c}: \beta_6 = \beta_7 = \beta_8 > 0 \quad \underline{F}_{.05} = 2.85$

The variance inflation factors (VIF) for this model indicated that the model was highly contaminated by multicollinearity. (See Appendix C, page 175). Most of this results from a failure of the coding to remove all the multicollinearity caused by squaring and/or cubing the independent variables. As Table 8 indicates, U.S. Relative Labor Productivity fails to be statistically significant at the .05 level, which results in a failure to reject the null hypothesis. In order to determine if the low $\underline{F}$ ratio for U.S. Relative Labor Productivity is the result of multicollinearity, the

Table 8. Model Two of Japan, 1952 - 1989
Standardized Cochrane-Orcutt Results
Dependent = Japan Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.1795	.0158	11.385	.0001		
(US RLP)	-.0050	.0240	-0.208	.8366		
(US RLP)^2	-.0003	.0120	-0.022	.9829		
Functional Form of US Relative Labor Productivity					0.03	.9713
(Japan RLP)	.0209	.0293	0.714	.4814		
(Japan RLP)^2	.0180	.0229	0.786	.4387		
(Japan RLP)^3	-.0173	.0093	-1.858	.0737		
Functional Form of Japan Relative Labor Productivity					3.42	.0309
(Japan DOMTRAN)	.0225	.0182	1.236	.2269		
(Japan DOMTRAN)^2	-.0057	.0193	-0.297	.7688		
(Japan DOMTRAN)^3	-.0061	.0162	-0.380	.7067		
Functional Form of Japan Domestic Transfers					0.59	.6257
Number of cases = 38	Durbin-Watson = 1.90					
R^2 = .55	Adjusted R^2 = .42					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

functional form of U.S. Relative Labor Productivity was used as a regressor independently of the other functional form variables. The functional form of U.S. Relative Labor Productivity remained statistically insignificant even when the other independent variable were removed from the model.

Japan's Relative Labor Productivity is the only functional form variable in this model that is significant beyond the .05 level. In this instance the null hypothesis is rejected, but only marginally so. The final functional form variable, Japan's Relative Domestic Transfer Payments, fails to be significant at the .05 level and leads to a failure to reject the null hypothesis. As a result of determining that the low $\underline{F}$ ratio for U.S. Relative Labor Productivity was the result of a lack of fit rather than multicollinearity, it can be deduced that the adjusted $\underline{R}^2$ of .42 is produced by the functional forms of Japan's Relative Labor Productivity and Relative Domestic Transfer Payments. However, the relatively low $\underline{F}$ ratios for these two functional forms (given an adjusted $\underline{R}^2$ of .42) means that multicollinearity also exists between these two variables.

Tables 9-12 show the results for the third model employing the independent variables: U.S. Relative Economic Size (US RECSIZE), each country's Relative Economic Size (RECSIZE), and each country's Infrastructural Power (INFPOW). Since data from the Japan sample was included in the pool, pooled RECSIZE and pooled INFPOW were additionally transformed into a third order polynomial. This was based on the patterns produced by Japan in Figure 15 and Figure 23 in the

previous chapter. Table 9 presents the results when Britain, France, and Japan are pooled. The operational model is formally expressed as:

$$\text{Pooled Rel Trade}_t = \beta_0 D_{\text{Britain}} + \beta_0 D_{\text{France}} + \beta_0 D_{\text{Japan}} + \beta_1 \text{ US RECSIZE}_t + \beta_2 (\text{US RECSIZE})^2_t + \beta_3 \text{ Pooled RECSIZE}_t + \beta_4 (\text{Pooled RECSIZE})^2_t + \beta_5 (\text{Pooled RECSIZE})^3_t + \beta_6 \text{ Pooled INFPOW}_t + \beta_7 (\text{Pooled INFPOW})^2_t + \beta_8 (\text{Pooled INFPOW})^3_t$$

Concerning the functional form of these independent variables, the following hypotheses can be constructed in order to test $\underline{F}_{.05}$:

U.S. Relative Economic Size:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.07$

Pooled Relative Economic Size:

H_{0b}: $\beta_3 = \beta_4 = \beta_5 = 0$ H_{1b}: $\beta_3 = \beta_4 = \beta_5 > 0$ $\underline{F}_{.05} = 2.68$

Pooled Infrastructural Power:

H_{0c}: $\beta_6 = \beta_7 = \beta_8 = 0$ H_{1c}: $\beta_6 = \beta_7 = \beta_8 > 0$ $\underline{F}_{.05} = 2.68$

Table 9 presents the strongest results of all the pooled models. The model is not contaminated by multicollinearity. (See Appendix C, page 176). The residual plots revealed a few outliers, but these were not sufficient to make heteroskedasticity a problem. (See Figure B.9 in Appendix B, page 159). The functional forms of each independent variable are statistically significant well beyond the .05 level. This leads to a rejection of all three null hypotheses. An adjusted partial $\underline{R}^2$ of .50 indicates that the model is a good fit. Thus, the functional forms of US RECSIZE,

Table 9. Model Three of Britain, France, & Japan Pooled, 1950 - 1989[a]
Standardized LSDV / Cochrane-Orcutt Results
Dependent = Pooled Relative Trade

Independent Variables	Beta[b]	Std. Error	t Ratio	Prob>t[c]	F Ratio	Prob>F
(US RECSIZE)	-.0391	.0079	-4.934	.0001		
(US RECSIZE)^2	-.0071	.0061	-1.156	.2504		
Functional Form of US Relative Economic Size					12.22	.0001
(Pooled RECSIZE)	-.0307	.0078	-3.933	.0002		
(Pooled RECSIZE)^2	-.0021	.0032	-0.665	.5077		
(Pooled RECSIZE)^3	.0021	.0019	1.079	.2832		
Functional Form of Pooled Relative Economic Size					7.56	.0001
(Pooled INFPOW)	.0414	.0090	4.577	.0001		
(Pooled INFPOW)^2	.0219	.0056	3.911	.0002		
(Pooled INFPOW)^3	-.0150	.0028	-5.373	.0001		
Functional Form of Pooled Infrastructural Power					11.54	.0001
Number of cases = 118	Durbin-Watson = 1.84					
Partial R^2 = .54[d]	Adjusted Partial R^2 = .50					

[a]Data for Japan begins in 1952.

[b]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[c]Two-tailed test.

[d]A dummy variable for each country was inserted into the model in order to correct for the inherent heteroskedasticity that results when samples are pooled. The Partial R^2 represents the percentage of the R^2 that was not accounted for by the dummy variables.

pooled RECSIZE, and pooled INFPOW each make highly significant contributions in accounting for the pooled Relative Trade of Britain, France, and Japan.

Table 10 shows the results of employing the same independent variables to account for the Relative Trade of Britain. The model in this instance is expressed as:

$$\text{Britain's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RECSIZE}_t + \beta_2 (\text{US RECSIZE})^2_t + \beta_3 \text{ Britain's RECSIZE}_t + \beta_4 (\text{Britain's RECSIZE})^2_t + \beta_5 \text{ Britain's INFPOW}_t + \beta_6 (\text{Britain's INFPOW})^2_t$$

The statistical significance of each independent variable in its functional form can be tested according to the following hypotheses:

U.S. Relative Economic Size:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.23$

Britain's Relative Economic Size:

H_{0b}: $\beta_3 = \beta_4 = 0$ H_{1b}: $\beta_3 = \beta_4 > 0$ $\underline{F}_{.05} = 3.23$

Britain's Infrastructural Power:

H_{0c}: $\beta_5 = \beta_6 = 0$ H_{1c}: $\beta_5 = \beta_6 > 0$ $\underline{F}_{.05} = 3.23$

An examination of the $\underline{F}$ ratios for the functional forms of U.S. Relative Economic Size and Britain's Relative Economic Size indicate that each is statistically significant beyond the .05 level. This allows for the rejection of the null hypothesis for each of these functional forms. On the other hand, the functional form of Britain's Infrastructural Power produces a low $\underline{F}$ ratio which is not statistically significant, therefore resulting in a failure to reject the null hypothesis. Since there

Table 10. Model Three of Britain, 1950 - 1989
Standardized Cochrane-Orcutt Results
Dependent = Britain Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.1498	.0076	19.82	.0001		
(US RECSIZE)	.0140	.0153	0.911	.3691		
(US RECSIZE)^2	.0407	.01211	3.354	.0021		
Functional Form of US Relative Economic Size					6.17	.0054
(Britain RECSIZE)	-.0553	.0146	-3.801	.0006		
(Britain RECSIZE)^2	.0044	.0101	0.436	.6656		
Functional Form of Britain Relative Economic Size					9.52	.0006
(Britain INFPOW)	.0006	.0115	0.054	.9575		
(Britain INFPOW)^2	.0044	.0053	0.836	.4095		
Functional Form of Britain Infrastuctural Power					0.53	.5926
Number of cases = 40	Durbin-Watson = 1.80					
R^2 = .55	Adjusted R^2 = .46					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

was only minimal evidence of heteroskedasticity (see Figure B.10 in Appendix B, page 160) and no problem with multicollinearity (see Appendix C, page 177), then the adjusted $\underline{R}^2$ of .46 is almost totally the result of U.S. Relative Economic Size and Britain's Relative Economic Size.

Table 11 presents the results for France based on a model almost identical to the one used for Britain in Table 10. The model is formally expressed as:

France's Rel Trade$_t$ = β_0 + β_1 US RECSIZE$_t$ + β_2 (US RECSIZE)^2_t + β_3 France's RECSIZE$_t$ + β_4 (France's RECSIZE)^2_t + β_5 France's INFPOW$_t$ + β_6 (France's INFPOW)^2_t

The statistical significance of each independent variable in its functional form can be tested according to the following hypotheses:

U.S. Relative Economic Size:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.23$

France's Relative Economic Size:

H_{0b}: $\beta_3 = \beta_4 = 0$ H_{1b}: $\beta_3 = \beta_4 > 0$ $\underline{F}_{.05} = 3.23$

France's Infrastructural Power:

H_{0c}: $\beta_5 = \beta_6 = 0$ H_{1c}: $\beta_5 = \beta_6 > 0$ $\underline{F}_{.05} = 3.23$

An examination of the variance inflation factors for this model reveal that it is moderately contaminated by multicollinearity. However, all of the VIFs are less than ten. (See Appendix C, page 178). Nevertheless, an examination of the $\underline{F}$ ratios is warranted. The functional forms of neither U.S. Relative Economic Size nor France's Relative Economic Size are statistically significant at the .05 level. This is

Table 11. Model Three of France, 1950 - 1989
Standardized Cochrane-Orcutt Results
Dependent = France Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.1879	.0090	20.832	.0001		
(US RECSIZE)	-.0259	.0139	-1.863	.0714		
(US RECSIZE)^2	.0004	.0070	0.061	.9518		
Functional Form of US Relative Economic Size					1.96	.1569
(France RECSIZE)	-.0125	.0074	-1.700	.0985		
(France RECSIZE)^2	.0034	.0028	1.226	.2288		
Functional Form of France Relative Economic Size					1.84	.1747
(France INFPOW)	.0560	.0153	3.659	.0009		
(France INFPOW)^2	-.0048	.0120	-0.404	.6885		
Functional Form of France Infrastructural Power					9.63	.0005
Number of cases = 40	Durbin-Watson = 1.82					
R^2 = .89	Adjusted R^2 = .87					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

similar to the results for Relative Labor Productivity presented in Table 3. In both cases the low F ratios resulted in a failure to reject H_{0a} and H_{0b}. Once again, the functional form of France's Infrastructural Power proved to be a strong explanatory variable. It is the only variable in the model that produces a large enough F ratio to be statistically significant at the .05 level. However, and F ratio of 9.63 is not large enough to deserve all the credit for an adjusted R^2 of .87. Most likely, both U.S. Relative Economic Size and France's Relative Economic Size are making important contributions to the model, although their exact significance is masked by multicollinearity.

Table 12 gives the results of Japan when U.S. Relative Economic Size, Japan's Relative Economic Size, and Japan's Infrastructural Power are used as independent variables. The model is formally expressed as:

$$\text{Japan's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RECSIZE}_t + \beta_2 (\text{US RECSIZE})^2_t + \beta_3 \text{ Japan's RECSIZE}_t + \beta_4 (\text{Japan's RECSIZE})^2_t + \beta_5 (\text{Japan's RECSIZE})^3_t + \beta_6 \text{ Japan's INFPOW}_t + \beta_7 (\text{Japan's INFPOW})^2_t + \beta_8 (\text{Japan's INFPOW})^3_t$$

Based on this model, the following hypotheses are constructed:

U.S. Relative Economic Size:

$H_{0a}: \beta_1 = \beta_2 = 0 \quad H_{1a}: \beta_1 = \beta_2 > 0 \quad F_{.05} = 3.25$

Japan's Relative Economic Size:

$H_{0b}: \beta_3 = \beta_4 = \beta_5 = 0 \quad H_{1b}: \beta_3 = \beta_4 = \beta_5 > 0 \quad F_{.05} = 2.85$

Japan's Infrastructural Power:

$H_{0c}: \beta_6 = \beta_7 = \beta_8 = 0 \quad H_{1c}: \beta_6 = \beta_7 = \beta_8 > 0 \quad F_{.05} = 2.85$

Table 12. Model Three of Japan, 1952 - 1989
Standardized Cochrane-Orcutt Results
Dependent = Japan Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.1639	.0072	22.820	.0001		
(US RECSIZE)	.0012	.0164	0.074	.9419		
(US RECSIZE)^2	.0175	.0093	1.881	.0704		
Functional Form of US Relative Economic Size					3.45	.0456
(Japan RECSIZE)	-.0370	.0189	-1.951	.0611		
(Japan RECSIZE)^2	-.0304	.0132	-2.315	.0281		
(Japan RECSIZE)^3	.0018	.0066	0.279	.7823		
Functional Form of Japan Relative Economic Size					8.40	.0004
(Japan INFPOW)	.0713	.0158	4.486	.0001		
(Japan INFPOW)^2	.0214	.0112	1.904	.0673		
(Japan INFPOW)^3	-.0186	.0058	-3.164	.0037		
Functional Form of Japan Infrastructural Power					14.02	.0001
Number of cases = 38	Durbin-Watson = 1.87					
R^2 = .79	Adjusted R^2 = .73					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

The F ratios for each of the functional forms in Table 12 are similar to the results presented for Japan in Table 4. The functional form of U.S. Relative Economic Size fails to produce a statistically significant F ratio, leading to a failure to reject the null hypothesis. Although the low F ratio may be partially due to the high multicollinearity in the model, it is most likely the result of a poor fit. Even when the other two independent variables are removed from the model, the functional form of U.S. Relative Economic Size cannot produce a statistically significant F ratio. On the other hand, Japan's functional forms of both Relative Economic Size and Infrastructural Power are statistically significant and lead to a rejection of the null hypothesis for each variable. The variance inflation factors indicate a high degree of multicollinearity. Almost all of the VIFs are greater than ten. (See Appendix C, page 179). However, the F ratios are large enough to indicate that the multicollinearity is not produced by the collinearity between US RECSIZE, Japan's RECSIZE, and Japan's INFPOW, but is produced by the polynomial transformations of each of these variables. This allows for more confidence in the F statistics produced by the model. Thus, the two variables (Japan's RECSIZE and Japan's INFPOW), are almost solely responsible for producing an adjusted R^2 of .73.

Tables 13-16 present the results for the fourth and final operational model used in this study. The independent variables are; U.S. Relative Economic Size, each country's Relative Economic Size, and each country's Relative Domestic Transfer Payments. As in previous pooled models, the data for Japan requires the

model to include a third order polynomial transformation for pooled RECSIZE and pooled Domtran. This is based on the patterns produced by Japan in Figure 16 and Figure 24 presented in the previous chapter. Table 13 summarizes the findings from pooling Britain, France, and Japan. The model is formally expressed as:

$$\text{Pooled Rel Trade}_t = \beta_0 D_{\text{Britain}} + \beta_0 D_{\text{France}} + \beta_0 D_{\text{Japan}} + \beta_1 \text{US RECSIZE}_t + \beta_2 (\text{US RECSIZE})^2_t + \beta_3 \text{Pooled RECSIZE}_t + \beta_4 (\text{Pooled RECSIZE})^2_t + \beta_5 (\text{Pooled RECSIZE})^3_t + \beta_6 \text{Pooled DOMTRAN}_t + \beta_7 (\text{Pooled DOMTRAN})^2_t + \beta_8 (\text{Pooled DOMTRAN})^3_t$$

Concerning the functional form of these independent variables, the following hypotheses can be constructed in order to test $\underline{F}_{.05}$:

U.S. Relative Economic Size:

$H_{0a}: \beta_1 = \beta_2 = 0 \quad H_{1a}: \beta_1 = \beta_2 > 0 \quad \underline{F}_{.05} = 3.07$

Pooled Relative Economic Size:

$H_{0b}: \beta_3 = \beta_4 = \beta_5 = 0 \quad H_{1b}: \beta_3 = \beta_4 = \beta_5 > 0 \quad \underline{F}_{.05} = 2.68$

Pooled Relative Domestic Transfer Payments:

$H_{0c}: \beta_6 = \beta_7 = \beta_8 = 0 \quad H_{1c}: \beta_6 = \beta_7 = \beta_8 > 0 \quad \underline{F}_{.05} = 2.68$

As was the case with the results presented in Table 9, the functional forms of both U.S. Relative Economic Size and pooled Relative Economic Size produce a large enough $\underline{F}$ ratio to be statistically significant beyond the .05 level. This leads to a rejection of the null hypotheses H_{0a} and H_{0b}. The functional form of pooled Relative Domestic Transfer Payments produces a low $\underline{F}$ ratio which results in a failure to reject the null hypothesis H_{0c}. The model does not contain enough

Table 13. Model Four of Britain, France, & Japan Pooled, 1950 - 1989[a]
Standardized LSDV / Cochrane-Orcutt Results
Dependent = Pooled Relative Trade

Independent Variables	Beta[b]	Std. Error	t Ratio	Prob>t[c]	F Ratio	Prob>F
(US RECSIZE)	-.0362	.0117	-3.083	.0026		
(US RECSIZE)^2	-.0083	.0081	-1.027	.3069		
Functional Form of US Relative Economic Size					4.75	.0106
(Pooled RECSIZE)	-.0278	.0088	-3.154	.0021		
(Pooled RECSIZE)^2	.0027	.0035	0.761	.4486		
(Pooled RECSIZE)^3	.0002	.0022	0.086	.9313		
Functional Form of Pooled Relative Economic Size					6.57	.0004
(Pooled DOMTRAN)	.0285	.0174	1.640	.1040		
(Pooled DOMTRAN)^2	-.0062	.0077	-0.802	.4243		
(Pooled DOMTRAN)^3	-.0050	.0070	-0.715	.4764		
Funtional Form of Pooled Domestic Transfers					1.18	.3228
Number of cases = 118	Durbin-Watson = 1.85					
Partial R^2 = .40[d]	Adjusted Partial R^2 = .36					

[a]Data for Japan begins in 1952.

[b]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[c]Two-tailed test.

[d]A dummy variable for each country was inserted into the model in order to correct for the inherent heteroskedasticity that results when samples are pooled. The Partial R^2 represents the percentage of the R^2 that was not accounted for by the dummy variables.

multicollinearity to be a serious problem. (See Appendix C, page 180). Nor was there an indication of serious heteroskedasticity. (See Figure B.13 in Appendix B, page 163). Considering this in combination with an adjusted partial $\underline{R}^2$ of only .36, the low $\underline{F}$ ratio for pooled Relative Domestic Transfer Payments is most likely due to a poor fit in the model.

Table 14 shows the findings for Britain when U.S. Relative Economic Size, Britain's Relative Economic Size, and Britain's Relative Domestic Transfer Payments are used as the independent variables in the model. In Britain's case, the model can be formally expressed as:

$$\text{Britain's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RECSIZE}_t + \beta_2 (\text{US RECSIZE})^2_t + \beta_3 \text{ Britain's RECSIZE}_t + \beta_4 (\text{Britain's RECSIZE})^2_t + \beta_5 \text{ Britain's DOMTRAN}_t + \beta_6 (\text{Britain's DOMTRAN})^2_t$$

The statistical significance of each independent variable in its functional form can be tested according to the following hypotheses:

U.S. Relative Economic Size:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.23$

Britain's Relative Economic Size:

H_{0b}: $\beta_3 = \beta_4 = 0$ H_{1b}: $\beta_3 = \beta_4 > 0$ $\underline{F}_{.05} = 3.23$

Britain's Relative Domestic Transfer Payments:

H_{0c}: $\beta_5 = \beta_6 = 0$ H_{1c}: $\beta_5 = \beta_6 > 0$ $\underline{F}_{.05} = 3.23$

An examination of the variance inflation factors (VIF) reveal that the model is partially contaminated by multicollinearity. (See Appendix C, page 181). The

Table 14. Model Four of Britain, 1950 - 1989
Standardized Cochrane-Orcutt Results
Dependent = Britain Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.2019	.0084	24.155	.0001		
(US RECSIZE)	-.0096	.0183	-0.522	.6055		
(US RECSIZE)^2	.0354	.0095	3.742	.0007		
Functional Form of US Relative Economic Size					13.52	.0001
(Britain RECSIZE)	-.0514	.0117	-4.378	.0001		
(Britain RECSIZE)^2	.0068	.0087	0.788	.4364		
Functional Form of Britain Relative Economic Size					15.08	.0001
(Britain DOMTRAN)	-.0191	.0211	-0.905	.3720		
(Britain DOMTRAN)^2	.0288	.0119	2.418	.0215		
Functional Form of Britain Domestic Transfers					5.13	.0116
Number of cases = 40	Durbin-Watson = 1.83					
R^2 = .74	Adjusted R^2 = .70					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

VIF for US RECSIZE is marginally less than ten, and greater than ten for DOMTRAN. This indicates that there is most likely collinearity between these two variables. Nevertheless, the problem is not sever enough to prevent the functional forms of all three independent variables from being statistically significant beyond the .05 level. Given this, for all three variables, the null hypothesis is rejected in favor of the research hypothesis. The model's goodness of fit is attributable to the fact that it produced an adjusted $\underline{R}^2$ of .70.

Table 15 gives the findings when the previous model is used to account for the Relative Trade of France. The model is expressed as:

France's Rel Trade$_t$ = β_0 + β_1 US RECSIZE$_t$ + β_2 (US RECSIZE)^2_t + β_3 France's RECSIZE$_t$ + β_4 (France's RECSIZE)^2_t + β_5 France's DOMTRAN$_t$ + β_6 (France's DOMTRAN)^2_t

The statistical significance of each independent variable in its functional form can be tested according to the following hypotheses:

U.S. Relative Economic Size:

H_{0a}: $\beta_1 = \beta_2 = 0$ H_{1a}: $\beta_1 = \beta_2 > 0$ $\underline{F}_{.05} = 3.23$

France's Relative Economic Size:

H_{0b}: $\beta_3 = \beta_4 = 0$ H_{1b}: $\beta_3 = \beta_4 > 0$ $\underline{F}_{.05} = 3.23$

France's Relative Domestic Transfer Payments:

H_{0c}: $\beta_5 = \beta_6 = 0$ H_{1c}: $\beta_5 = \beta_6 > 0$ $\underline{F}_{.05} = 3.23$

Contrary to the findings presented in Table 11, in Table 15 the functional forms of both U.S. Relative Economic Size and France's Relative Economic Size are

Table 15. Model Four of France, 1950 - 1989
Standardized Cochrane-Orcutt Results
Dependent = France Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.0459	.0041	11.170	.0001		
(US RECSIZE)	-.0564	.0170	-3.316	.0022		
(US RECSIZE)^2	-.0019	.0109	-0.178	.8599		
Functional Form of US Relative Economic Size					5.63	.0079
(France RECSIZE)	-.0315	.0077	-4.089	..0003		
(France RECSIZE)^2	.0040	.0025	1.566	.1270		
Functional Form of France Relative Economic Size					8.64	.0010
(France DOMTRAN)	.0188	.0163	1.153	.2573		
(France DOMTRAN)^2	-.0076	.0113	-0.670	.5072		
Functional Form of France Domestic Transfers					0.85	.4381
Number of cases = 40	Durbin-Watson = 1.96					
R^2 = .75	Adjusted R^2 = .71					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

statistically significant beyond the .05 level, thereby leading to a rejection of the null hypothesis for both of these variables. On the other hand, the functional form of France's Relative Domestic Transfer Payments produces a low F ratio of 0.85 which results in a failure to reject the null hypothesis for this variable. Although the model is partially contaminated by multicollinearity, it could not be described as severe. The variance inflation factor for each variable is less than ten. (See Appendix C, page 182). Nevertheless, given that the model produced an adjusted R^2 of .71, it should have also provided larger F ratios than the one in Table 15. Thus, even the moderate multicollinearity in the model must be detracting from the significance of each functional form.

Table 16 presents the results for Japan when U.S. Relative Economic Size, Japan's Economic Size, and Japan's Relative Domestic Transfer Payments are used as the independent variables. Relative Economic Size and Relative Domestic Transfer Payments needed to be both squared and cubed in order to linearize the relationship with Japan's Relative Trade. The full model is expressed as:

$$\text{Japan's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RECSIZE}_t + \beta_2 (\text{US RECSIZE})^2_t + \beta_3 \text{ Japan's RECSIZE}_t + \beta_4 (\text{Japan's RECSIZE})^2_t + \beta_5 (\text{Japan's RECSIZE})^3_t + \beta_6 \text{ Japan's DOMTRAN}_t + \beta_7 (\text{Japan's DOMTRAN})^2_t + \beta_8 (\text{Japan's DOMTRAN})^3_t$$

Based on this model, the following hypotheses are constructed:

U.S. Relative Economic Size:

$H_{0a}: \beta_1 = \beta_2 = 0 \quad H_{1a}: \beta_1 = \beta_2 > 0 \quad F_{.05} = 3.25$

Table 16. Model Four of Japan, 1952 - 1989
Standardized Cochrane-Orcutt Results
Dependent = Japan Relative Trade

Independent Variables	Beta[a]	Std. Error	t Ratio	Prob>t[b]	F Ratio	Prob>F
Intercept	.1679	.0137	12.248	.0001		
(US RECSIZE)	.0022	.0236	0.095	.9247		
(US RECSIZE)^2	.0127	.0134	0.944	.3534		
Functional Form of US Relative Economic Size					0.71	.5019
(Japan RECSIZE)	-.0020	.0239	-0.084	.8966		
(Japan RECSIZE)^2	-.0185	.0181	-1.023	.3625		
(Japan RECSIZE)^3	-.0082	.0089	-0.922	.3644		
Functional Form of Japan Relative Economic Size					4.93	.0071
(Japan DOMTRAN)	.0258	.0200	1.290	.2076		
(Japan DOMTRAN)^2	.0040	.0187	0.215	.8311		
(Japan DOMTRAN)^3	.0010	.0146	0.070	.9445		
Functional Form of Japan Domestic Transfers					2.03	.1318
Number of Cases = 38	Durbin-Watson = 1.93					
R^2 = .57	Adjusted R^2 = .45					

[a]As a result of transforming the independent variables into standard deviation units, the sign of the Betas no longer necessarily indicate the direction of the relationship between the independent and dependent variables.

[b]Two-tailed test.

Japan's Relative Economic Size:

H_{0b}: $\beta_3 = \beta_4 = \beta_5 = 0$ H_{1b}: $\beta_3 = \beta_4 = \beta_5 > 0$ $\underline{F}_{.05} = 2.85$

Japan's Relative Domestic Transfer Payments:

H_{0c}: $\beta_6 = \beta_7 = \beta_8 = 0$ H_{1c}: $\beta_6 = \beta_7 = \beta_8 > 0$ $\underline{F}_{.05} = 2.85$

The $\underline{F}$ ratio for U.S. Relative Economic Size is once again low, leading to a failure to reject the null hypothesis for this variable. In order to determine whether or not the insignificant $\underline{F}$ ratio is due to high multicollinearity in the model, the other two variable were removed from the model. Even with these other variables removed, U.S. Relative Economic Size failed to be statistically significant. Japan's Relative Economic Size produces a $\underline{F}$ that is statistically significant, resulting in a rejection of the null hypothesis H_{0b}. The final functional form, Japan's Relative Domestic Transfer Payments, fails to produce a statistically significant $\underline{F}$ ratio. The model produces a respectable adjusted $\underline{R}^2$ of .45. Nevertheless, assuming that almost all of this is the contribution of only two variables (Japan's RECSIZE and DOMTRAN), higher $\underline{F}$ ratios would be expected than those found in Table 16. Therefore, in addition to the model having multicollinearity due to the linear transformations in the model, there must also be some multicollinearity between the functional forms. (See Appendix C, page 183).

CHAPTER FIVE:

DISCUSSION

This study is an attempt to initiate a more sophisticated structural account of relative changes in the international trade of three industrial democracies. Towards this end, explanatory factors from both the systems and state level were employed to construct a structural model. At the level of the international system, this study focused on the concept of U.S. hegemony. At the state level, the study focused on the international economic power and the domestic regulatory capacities of Britain, France, and Japan. Two operational variables were selected as indicators for each of these three factors. These operational variables were used to construct four different operational/testable models. This chapter discusses the extent to which these four operational models support the hypothesis that the Relative Trade of Britain, France, and Japan from 1950 to 1989, is a function of changes in three factors: U.S. economic hegemony, each country's relative international economic power, and each country's domestic regulatory capacity.

Discussion of Each Model

Model One: Relative Trade = U.S. Relative Labor Productivity + B,F,J Relative Labor productivity + B,F,J Infrastructural Power

The first model tested the hypothesis that the Relative Trade of Britain, France, and Japan is a function of changes in U.S. Relative Labor Productivity, each country's Relative Labor Productivity, and each country's Infrastructural Power. The results were presented in Tables 1-4. When the three countries were pooled, the functional forms of all three variables were statistically significant. However, none of the three countries, when examined separately, had a statistically significant finding for all three functional forms. For Britain, only U.S. Relative Labor Productivity and Britain's Relative Labor Productivity were statistically significant. In the case of France, the functional form of Infrastructural Power was the only variable that proved to be statistically significant. The analysis of Japan revealed that only the variables unique to Japan, i.e. Japan's Relative Labor Productivity and Infrastructural Power, were significant. Therefore, although the pooled model produced statistically significant results for all three functional forms, when isolated, the model for each country produces a unique combination of statistically significant variables.

Model Two: Relative Trade = U.S. Relative Labor Productivity + B,F,J Relative Labor Productivity + B,F,J Relative Domestic Transfer Payments

The second model employed U.S. Relative Labor Productivity, each country's Relative Labor Productivity, and each country's Relative Domestic Transfer Payments as independent variables. The results were presented in Tables 5-8. This particular model was the poorest performer of all four models. When the three countries were pooled, Relative Domestic Transfer Payments was the only statistically significant functional form. Whereas U.S. Relative Labor Productivity and pooled Relative Labor Productivity had been significant in the previous model, they were insignificant in this second model. When a separate analysis was conducted on each country, the results were less than impressive. Relative Domestic Transfer Payments is correlated with Relative Labor Productivity, thereby making it difficult to specify the statistical significance of each variable. In the case of Britain, none of the functional forms were significant. For France, only Relative Domestic Transfer Payments was significant. Japan showed a marginal significance for Japan's Relative Labor Productivity.

In spite of the relatively poor performance of the second model, it shares some similarities with the first model. In the case of Britain, although none of the functional forms were significant, U.S. Relative Labor Productivity and Britain's Relative Labor Productivity produced the highest F ratios of the three functional forms in the model. Each would have been significant at the .10 level. Nevertheless, in both the first and second versions of the British model, U.S.

Relative Labor Productivity and British Relative Labor Productivity produced noticeably higher F ratios than Infrastructural Power and Relative Domestic Transfer Payments.

A similar situation can be found with the first and second models for France. However, in this instance the highest F ratios were produced by France's domestic component, i.e., Infrastructural Power and Relative Domestic Transfer Payments. In the case of Japan, both the first and second models failed to produce a statistically significant F ratio for U.S. Relative Labor Productivity. In other words, almost all of the explanatory significance of the model comes from factors unique to Japan, rather than relying on the significance of U.S. Hegemony. Although Relative Domestic Transfer Payments is not statistically significant in the second model, this is most likely due to a high correlation with Japan's Relative Labor Productivity. The important point here is that in both the first and second models, U.S. Relative Labor Productivity made practically no explanatory contribution to account for the Relative Trade of Japan.

Model Three: Relative Trade = U.S. Relative Economic Size + B,F,J Relative Economic Size + B,F,J Infrastructural Power

The third model employed U.S. Relative Economic Size, each country's Relative Economic Size, and each country's Infrastructural Power as explanatory variables. The results were presented in Tables 9-12. When the model was applied to a pooling of Britain, France, and Japan, it produced impressive results. Each of

the three functional forms was highly significant. When each country was examined separately, the models produced interesting results. In the case of Britain, U.S. Relative Economic Size and Britain's Relative Economic Size were the only significant functional forms produced by the model. For France, Infrastructural Power was the only statistically significant functional form. In the case of Japan, all three functional forms were significant. However, U.S. Relative Economic Size was only marginally significant. Japan's Relative Economic Size and Infrastructural Power clearly made the greatest contribution to the model.

Model Four: Relative Trade = U.S. Relative Economic Size + B,F,J Relative Economic Size + B,F,J Infrastructural Power

The fourth model employs U.S. Relative Economic Size, each country's Relative Economic Size, and each country's Relative Domestic Transfer Payments as independent variables. The results were presented in Tables 13-16. When the three countries were pooled, the functional forms of only U.S. Relative Economic Size and pooled Relative Economic Size were statistically significant. In the case of Britain, all three functional forms were significant. This is the only British model in which all three functional forms were statistically significant. For France, this fourth model produced a significant finding for both U.S. Relative Economic Size and France's Relative Economic Size. Finally, in the case of Japan, only Japan's Relative Economic Size showed a statistical significance. It is likely that Japan's Relative Domestic Transfer Payments also made an important contribution to the

model, however an accurate measure of this contribution is hindered by a correlation with Japan's Relative Economic Size.

In general, the two models employing Relative Domestic Transfer Payments as an operational measure of Domestic Regulatory Capacity performed less well than the two models which used Infrastructural Power. In the two models in which Relative Domestic Transfer Payments was used (models two and three), not only did this variable not perform well, but it often caused the other independent variables to have low F ratios. Except for Britain's results presented in Table 14, the results for Relative Domestic Transfer Payments indicate that it is most likely a poor fit for this type of model. Whereas Infrastructural Power is essentially a relative measure of tax revenues extracted by a government, Domestic Transfer Payments is a relative measure of a government's social spending. It may be the case that Relative Domestic Transfer Payments would be more appropriate as an intervening variable, dependent variable, or perhaps in another model. Determining the most appropriate specification for Relative Domestic Transfer Payments will most likely be contingent on further theoretical developments.

The two models that employed Infrastructural Power as an independent variable (models one and three) produced impressive results. When the three countries were pooled, these two models showed that each of the three following independent variables was highly significant: the systems level indicators for U.S. economic hegemony (U.S. Relative Labor Productivity and U.S. Relative Economic Size), the state level indicators for relative international economic power (pooled

Relative Labor Productivity and pooled Relative Economic Size), and the state level indicator for domestic regulatory capacity (Infrastructural Power).

Discussion of Each Country

Although the models give a powerful account of a pooling of the Relative Trade of Britain, France, and Japan, a closer comparison of the results for each country reveals patterns and/or trends that are unique to each.

Britain

In all but the fourth model (Table 14), the variables which focus on international factors (i.e., operational measures of U.S. economic hegemony and each country's relative international economic power) are the only variables that are significant. In other words, it would seem that British domestic factors involving relative changes in taxation and social spending (i.e., Infrastructural Power and Relative Domestic Transfer Payments) make an insignificant or minimal contribution to the model. Even in the fourth model for Britain (Table 14) Relative Domestic Transfer Payments, although significant, is the least significant variable.

All four models present a similar picture in the case of Britain. The models reveal that U.S. economic hegemony and the relative international economic power of Britain offer a much more significant explanation for changes in Britain's Relative Trade than Britain's domestic regulatory capacity. A survey of contemporary British economic policy offers a possible explanation for these statistical findings. British

industrial strength had been in relative decline since before the turn of the century. This decline continued during the years examined by this study. From 1950 to 1989 Britain's Relative Labor Productivity and Relative Economic Size declined at an average annual rate of -1.4% and -.7% respectively (Peet 1992, 113 & 118). In spite of this decline, Britain has maintained a preference for open trade. This is reflected not only in Britain's traditional resistance to trade barriers, but also in its extensive trade and foreign direct investment with the United States. In fact, during the years relevant to this study, Britain has been the largest foreign investor in the U.S., followed by the Dutch and Japan. This relationship with the United States helps account for the strong statistical relationship between Britain's Relative Trade and U.S. economic hegemony.

It is more challenging, however, to offer an explanation of Britain's significant relationship between relative international economic power and Relative Trade, and the generally insignificant relationship between domestic regulatory capacity and Relative Trade. Nevertheless, John Zysman (1983) presents evidence from Britain's attempt to stimulate industrial production which also can be used to help explain the empirical findings presented earlier. After World War II, it became evident to the British government that its continued industrial decline relative to the rest of the world would not be self-correcting. Therefore, the government made an effort to impose an industrial policy that would make British industry more internationally competitive. However, this attempt ultimately failed due to the resistance of three institutional interests. First, private industry was fundamentally opposed to

government intervention into their affairs. In spite of British industry's relative decline, the industrial interests successfully thwarted government regulatory attempts which could have made them more competitive.

The second leg of institutional resistance came from the financial sector. The British government wanted to devalue the pound-sterling in an attempt to stimulate exports and domestic production. However, the financial interests wanted to maintain the strength of sterling in order to preserve Britain's over extended role as an international financial leader. The third area of resistance came from Parliament. Not only did the conflict between the Labour and Conservative parties hinder efforts at industrial revitalization, but in the end both parties tended to favor the redistribution of wealth over the reinvestment in industrial competitiveness. Therefore, industrial production was subsidized where jobs were needed rather than in high-tech sectors, and increased revenues from North Sea oil production during the 1970s was used to increase social services rather than fund industrial investment.

The relevance of these events for this study rest in the support they give to findings presented in the previous chapter. First, the fact that U.S. economic hegemony is significantly related to Britain's Relative Trade can be explained by Britain's continued openness and exposure toward the U.S. economy. Second, Britain's relative international economic power is significantly related to it Relative Trade because of industry's persistence at reaping short-term gains through trade even though it damaged their long term competitiveness. Finally, although Britain increased its domestic regulatory capacity during these years, it did so with little

regard to the state of its industrial health. In other words, the taxing and spending involved in the redistribution of wealth were conducted irrespective of the decline in Britain's industrial and trade competitiveness. Given this, it should not be surprising that in general, a statistically insignificant relationship exists between Britain's domestic regulatory capacity and its Relative Trade.

France

The results for France lead to a conclusion almost the opposite of Britain. Whereas the domestic component of the models is, at best, of minimal importance for Britain, it is of primary importance for France. All four of the models produced impressively high adjusted $\underline{R}^2$s. Furthermore, in all but the fourth model (Table 15) the domestic component (Infrastructural Power or Relative Domestic Transfer Payments) was the only statistically significant functional form. In the fourth model, Relative Domestic Transfer Payments was not significant, while the other two functional forms were significant.

Essentially, in the case of France, the relationship between domestic regulatory capacity and Relative Trade is highly significant while U.S. economic hegemony and France's relative international economic power have a low or insignificant relationship with Relative Trade. Thus, domestic factors are more important in accounting for France's Relative Trade than international or U.S. factors. There are both empirical and theoretical reasons why this is so.

An empirical explanation should focus on the unique characteristics of France's Infrastructural Power and Relative Domestic Transfer Payments. First, France's Infrastructural Power has risen at an average annual rate of 4.3% from 1950 to 1989. This is essentially the rate that the French government has been able to increase direct taxes relative to GDP. This 4.3% average annual increase in Infrastructural Power is greater than that of Japan (3.3%) and greater than that of Britain (.9%) (Peet 1992, 120). Such a rapid increase in Infrastructural Power had to be accompanied by domestic economic growth. This growth was fueled by rising exports and imports which gave France a 1.9% average annual increase in Relative Trade compared to .6% for Britain and .3% for Japan (Peet 1992, 107). Therefore, it is not merely coincidence that France's growth rate in Infrastructural Power and Relative Trade is higher than that of Britain and Japan. In the case of France, Infrastructural Power and Relative Trade are strongly related to each other.

France's Relative Domestic Transfer Payments also possess some interesting empirical characteristics, although in a different manner than France's Infrastructural Power. France's Relative Domestic Transfer Payments has grown more slowly than that of Britain and Japan from 1950 to 1989. This is so because France's Relative Domestic Transfer Payments has always been high relative to Britain and Japan, and it has changed little over the 40 year period covered in this study. For example, during the years between 1950 and 1954, domestic transfer payments composed an average of 11.9% of France's GDP. This is quite large when compared with 5.3% for Britain and 3.1% for Japan during the same time period. By 1985 to 1989,

France's domestic transfer payments composed 19.9% of its GDP compared with 12.5% for Britain and 11.8% for Japan (Peet 1992, 122). Thus, France has always provided liberal amounts of direct transfer payments, even when its economy was weak during the early 1950s. However, since France's Relative Domestic Transfer Payments have changed only slightly over these years, it does not always do a good job of accounting for the large increase in Relative Trade.

From a theoretical standpoint, France presents some peculiar challenges. A theoretical explanation must be given to account for the fact that, in general, France's domestic factors are highly related to Relative Trade while France's international factors and U.S. economic hegemony are not. France is often viewed as a highly centralized state which exercises considerable influence over its society. Based on the general theory developed back in chapter three of this study, one would expect a highly centralized state to resist exposure to international trade. However, as has already been shown, France had the highest average annual growth rate for Relative Trade from 1950 to 1989. It was also theorized that a highly centralized state would emphasize the extraction of wealth from its own society. This would seem to be true for France since, as mentioned above, it had the highest average annual increase in Infrastructural Power. Thus, this study is presented with the theoretical dilemma of explaining why France has such a strong relationship between increases in exposure to international trade and relative increases in revenue extraction from society.

Back in chapter three of this study, reference was made to the theoretical possibility that a highly centralized state may over time become dependent on society for providing policy direction rather than imposing policy on society (see page 25). Hellen Milner (1989) offers an explanation of why France has resisted attempts to insulate it from exposure to international trade in spite of its highly centralized state institutions. Milner makes the point that state bureaucratic institutions worked so closely with local entrepreneurs that the bureaucrats became dependent on local economic leaders for directing state economic trade policy. In short, the local entrepreneurs who wished to trade their goods internationally were successful at redirecting French bureaucrats away from raising trade barriers. As a result, France's trade policy often reflected the domestic trade interests of rising entrepreneurial groups rather than purely state interests which would favor protection from exposure to international trade.

Therefore, at least in the case of France, it can be hypothesized that local entrepreneurial groups successfully influenced state bureaucrats to encourage international trade. This increase in trade stimulated economic growth, thereby giving the French government a growing source of tax revenue. This growing revenue source was exploited by the government as can be seen by France,s growth in Infrastructural Power and its relatively high levels of Relative Domestic Transfer Payments. If this hypothesis is true, then it is not surprising that in the case of France, domestic regulatory capacity is strongly related to Relative Trade while U.S. economic hegemony and France's relative international economic power are not.

Japan

A different trend is revealed by the models used for Japan. In the case of Japan, the operational measures of U.S. economic hegemony (U.S. Relative Labor Productivity and U.S. Relative Economic Size) made almost no contribution to the model. In the third model (Table 12), U.S. Relative Economic Size is statistically significant, but only marginally so. In all the other models, the operational measures of U.S. economic hegemony were not significant. In other words, the best predictors of Japan's Relative Trade are found at the state level of analysis rather than the systems level. For Japan, it can be argued that both Japan's international and domestic components work together to give the best account of changes in Japan's Relative Trade.

In order to offer a fuller explanation for Japan's results, it will be helpful to examine three facets of Japan's political economy. These are the empirical characteristics of the Japanese data, the nature of the relationship between government and industry, and the significant role of interfirm trade in Japan. First, Japan's Relative Trade is unique in that it changed relatively little from 1952 to 1989 in comparison to Britain and France. Although Japan's international trade has risen dramatically during this time period, its GNP has risen equally dramatically. In other words, for Japan, both international trade and GNP have risen in tandem such that the ratio between the two has remained relatively constant. Exports and imports as a percentage of GNP have ranged between 18% and 24%. This compares with 31% and 44% for Britain, and 19% and 39% for France (Peet 1992,

107). This would suggest that there is some form of intentional coordination between Japan's international trade and economic growth.

That the Japanese government and industry share a close working relationship is no secret. However, understanding the nature of this relationship has been somewhat confusing. Giovani Dosi, Laura D'Andrea Tyson, and John Zysman (1989) claim that Japan's intentional protection of domestic markets and its practice of industry subsidization, rather than being viewed from a traditional economic perspective as an example of undesirable price inefficiencies, should more accurately be understood as strategic interventions designed to maximize Japan's economic development. Whereas traditional economic theory would interpret Japan's governmental interventions as distorting the mechanics of the free market, Dosi, Tyson, and Zysman (1989, 4) set forth what they call a Shumpeterian perspective in which the efficiencies of price competition are far less important than the efficient innovation of new products and the role that these new products play in stimulating economic growth. From this Schumpeterian perspective, the free market is not the most efficient means toward these ends. Rather, by targeting those industries with the greatest potential for producing technological innovation and economic growth, the Japanese government has successfully intervened to provide these industries with investment capital and protection from competition. This type of intervention is reflected in the fact that international trade and GNP have followed a parallel course.

Given such a close relationship between government and industry, it is no surprise that Japan's Infrastructural Power is the strongest predictor of Relative Trade. Since Infrastructural Power is essentially a measure of taxes relative to GNP and the extent to which this revenue is directly expropriated from industry and households, then Infrastructural Power is a good measure of a government's capacity to employ revenues as a tool for directing economic and social activity. Japan's data for Infrastructural Power from 1952 to 1989 has always been greater than France's and greater than Britain's since 1989 (Peet 1992, 120). In Japan's case, it is assumed that increases in Infrastructural Power allowed government officials to steer economic production toward product innovation and economic growth. Japan's Relative Domestic Transfer Payments performed well in the models, although not as well as Infrastructural Power. This is most likely because the proportion of tax revenues transfered to households is smaller than the proportion of transfers made by Britain and France. Therefore, Japan's Relative Domestic Transfer Payments is not associated with Relative Trade to the extent that it might be in some other countries.

Furthermore, it is not surprising that Japan's measures of relative international economic power (Relative Labor Productivity and Relative Economic Size) were always statistically significant in the results presented in the previous chapter. The ultimate goal of this coordination between government and industry was to produce economic growth. Japan's success towards this end is reflected in the fact that its average annual growth rate for both Relative Labor Productivity and

Relative Economic Size was 3.6% and 5.4% respectively. Britain had negative percentages for both of these measures while France averaged less than 1% annual growth for both (Peet 1992, 113 and 118). Japan's intentional coordination among production, growth, and trade is reflected in the statistical significance of these measures.

Finally, an explanation must be given for the fact that in the case of Japan, U.S. economic hegemony was never a statistically significant predictor of Japan's Relative Trade. A plausible explanation for these results rests in Japan's unique structure of international trade. Michael Gerlach (1989) points out that the particular organization of the Japanese economy has important implications for the performance of Japanese trade. Most international economists assume that a country's international trade is effected by three important factors: macroeconomic changes closely tied to currency realignments, government policy concerning trade tariffs, and the nature of the relationship among the firms involved in international trade. Although traditional economic analysis might focus on the first two of these factors, Gerlach believes that the nature of the relationship among Japanese firms is the most important factor effecting Japan's international trade.

Interfirm trade in Japan is dominate by long-standing and identifiable networks called keiretsu. These keiretsu are vertically organized within different industrial sectors connecting suppliers to manufacturers. Some of the suppliers and manufacturing plants are in the form of Japanese foreign direct investment in other countries. Furthermore, in addition to being vertically integrated, the keiretsu are

also intermarket integrated. That is, different industrial sectors are connected to each other by using the same large banks, insurance companies, and other financial institutions. These intermarket relationships are also involved in international trade. Finally, all keiretsu international trade, whether vertical or intermarket, passes through a group trading company, or sogo shosha. These trading groups provide well established trade networks which make intermarket trade much more efficient than would be the case under the workings of the free market.

Gerlack claims that the sogo shosha are most important for facilitating intermarket trade among heavy industrial groups. Consumer industries, such as automobiles and electronics, conduct much of their international trade along vertical lines. Gerlach claims that combined, the vertical and intermarket trade handled by the sogo shosha composes two-thirds of all of Japan's international trade (Gerlach 1989, 169).

Given the nature of Japan's international interfirm trade it is not surprising that U.S. economic hegemony performed poorly in all four of the models tested. Since so much of Japan's international trade is based on long-term interfirm relationships, then such exogenous distortions as the United States' inability to stabilize global exchange rates or compel other governments to adopt free trade policies, would have only a minimal effect on Japan's international trade. Therefore, as the results in the previous chapter showed, both measure of U.S. economic hegemony (U.S. Relative Labor Productivity and U.S. Relative Economic Size) were poor predictors of changes in Japan's Relative Trade.

A Discussion of Each Factor

Given the assumption that the operational measures used in this study are valid indicators of U.S. economic hegemony, each country's relative international economic power, and each country's domestic regulatory capacity, several general conclusions can be drawn about each of these factors. When analyzing the pooled data, each of the three factors are important for giving an account of the Relative Trade of the three countries. However, what is true for the pool is not necessarily true for each country. Although each factor was almost always significant when the three countries were pooled, a different conclusion develops when each country is examined separately. For example, although much has been written attesting to the important causal link between U.S. economic hegemony and international trade, in this study U.S. economic hegemony provided a minimal and/or inconsistent account of the Relative Trade of France and Japan. Besides the pooled models, only Britain's models showed that U.S. economic hegemony was an important factor.

Concerning those factors which stem from the state level, the results are also mixed when each country is examined separately. For example, domestic regulatory capacity was a significant factor for Britain only once. (see Relative Domestic Transfer Payments in Table 14 page 113), but it was the most important factor for France in all the models except the fourth model (see Relative Domestic Transfer Payments in Table 15 page 115). Finally, the state level factors were almost totally responsible for explaining the Relative Trade of Japan.

In general, in both the pooled and individual country models, the best performing variables were U.S. Relative Economic Size, each country's Relative Economic Size, and each country's Infrastructural Power. Relative Economic Size is a well established measure in the literature concerning this subject matter. Its reliability and validity is bolstered by this study in that it proved to be a good measure of economic power, both in terms of U.S. economic hegemony and the relative economic power of the individual countries. Infrastructural Power seems to be good indicator of the extent to which a state penetrates its society in order to direct social and economic activity in what government officials believe to be the national interest.

Relative Labor Productivity and Domestic Transfer Payments performed well in all the models, although not as well as Relative Economic Size and Infrastructural Power. The construction of Relative Labor Productivity employs labor and production data that is not always reliable. Nevertheless, it is often used as a measure of economic strength or competitiveness. Perhaps, it performed less well than Relative Economic Size because of these liabilities. (For a discussion of the strength and weaknesses of using Relative Labor Productivity as a variable, see Lake 1988, 233-36). Relative Domestic Transfer Payments was the worst performing of all the variables. It should be remembered that Relative Domestic Transfer Payments is a measure of the extent to which governments legitimize their authority by ensuring domestic welfare. Although this study provided a sound theoretical reason why Relative Domestic Transfer Payments should be a good predictor of a

state's Relative Trade, alternatively it may be that governments provide economic assistance to their citizens regardless of the state's trade competitiveness. On the surface, other theoretical relationships between Relative Domestic Transfer Payments and Relative Trade may seem plausible. For example, it may be that Relative Domestic Transfer Payments may work better as the dependent variable and Relative Trade as the independent variable. Nevertheless, additional theoretical and empirical work is need in order to determine the proper relationship between these two variables.

Conclusion

The unique contribution of this research stems from its provocative integration of existing theoretical and empirical work in order to combine important explanatory factors for relative changes in international trade. This research was conducted in response to a general lack of empirical support for hegemonic stability theory. The results presented earlier not only contribute to a fuller accounting of relative changes in trade than can be explained by hegemonic stability theory alone, but they also lend strong empirical support for contemporary theoretical discussions involving the integration of international and domestic structures of the political economy. An appreciation for the importance of these contributions can be enhanced by a cursory summation of this research.

In the early 1970s, a theoretical argument developed which proposed that the impressive growth in international trade since the end of World War II was a direct

function of the United States assuming leadership in stabilizing what would otherwise ostensibly be a chaotic international economic system. In 1972 the United States began to retreat from some of the stabilizing functions that it had performed up to that time. Given this turn of events, some scholars predicted that the world would soon devolve into self destructive economic competitiveness characterized by declining levels of international trade.

In spite of the United States' abandonment of some of its self appointed regulatory responsibilities, the international economic system has remained impressively stable and international trade continues to flourish. In addition to this all too obvious development, empirical tests involving the relationship between U.S. hegemony and international trade have found only limited support. Thus, important and fundamental shifts in international trade are due to much more than changes in the United States' ability to regulate the international economic system. Additional explanatory factors were considered in order to offer a fuller account for changes in post war international trade.

In order to construct a fuller explanation for fundamental changes in international trade, this research was guided by a recent theoretical trend which incorporates separate structural factors from both the international and domestic political economy in order to account for concrete international events. With respect to this study, this meant explaining relative changes in the international trade of particular countries by supplementing measures of U.S. economic hegemony with international and domestic measures of the political economy of the countries in

question. The resulting structural model proposed to explain relative changes in the international trade of a given country as a function of changes in the following: U.S. economic hegemony, the country's relative international economic power, and the country's domestic regulatory capacity. Each of these three explanatory factors were given two separate operational measures. These various operational measures were then combined to construct four different operational models. These models were used to explain changes in the Relative Trade of Britain, France, and Japan from 1950 to 1989.

Based on previous theoretical and empirical work, it was hypothesized that the relationship between economic power and international trade was curvilinear such that states would have high levels of Relative Trade when their economic power was low. However, as their economic power increased to moderate levels, they would decrease their exposure to trade in an attempt to enhance their economic autonomy. As their economic power increases to high levels, states would increase their levels of trade because they could now demand more favorable terms of trade. This theoretical U-shaped relationship found empirical support when the Relative Trade of Britain, France, and Japan were plotted against measures of U.S. economic hegemony and each state's relative international economic power. The most noticeable exception was Japan's relative international economic power which reversed direction and became negative a second time, thus producing a pattern typical of a third order polynomial.

A curvilinear pattern was also predicted for the relationship between Relative Trade and domestic regulatory capacity. In this case, it was hypothesized that Relative Trade would increase as a state shifted from low to moderate levels of domestic regulatory capacity, and decrease as a state moved from moderate to high levels of domestic regulatory capacity. The hypothesis for this ∩-shaped pattern was based on the assumption that when a state's domestic regulatory capacity is low, leaders will encourage international trade as a means of stimulating economic growth, thus giving leaders a larger potential source of tax revenue. At high levels of domestic regulatory capacity, leaders would reduce their exposure to trade in order to enhance their ability to stabilize the domestic economy. This relationship was confirmed for Britain and France. However, once again Japan produced an unanticipated double bent curve characterized by declining, then rising, and finally declining levels of Relative Trade as Japan's domestic regulatory capacity moved from low to high levels.

After transforming the data in order to compensate for curvilinear relationships between the dependent and independent variables, an econometric time-series regression was conducted. Although each operational model possessed some unique characteristics, the combined results produced by all four operational models supported some general conclusions. When the data for the three countries were pooled, the four models and the operationalized variables in the model performed well, although Relative Domestic Transfer Payments was the least successful of all the operational variables at producing statistically significant results.

Nevertheless, it can be concluded that when the three countries were pooled, the models offer strong support for the theory that relative changes in a country's international trade are a function of U.S. economic hegemony, the country's relative international economic power, and the country's domestic regulatory capacity.

When examined separately, each country had a unique combination of statistically significant explanatory factors. In the case of Britain, U.S. economic hegemony and Britain's relative international economic power were the most important explanatory factors. This was attributed to the close trade relationship between Britain and the United States, and the persistence of British private industry to continue to trade internationally in spite of a relative decline in economic competitiveness. The weak relationship between Britain's Relative Trade and domestic regulatory capacity was attributed to an absence of purposeful coordination between increases in taxes and social spending, and an economic growth initiative that could have been fueled by international trade.

The results for France revealed a strong relationship between France's domestic regulatory capacity and Relative Trade, and a weaker relationship for U.S. economic hegemony and France's relative international economic power. An argument was presented which attributed the strength of domestic regulatory capacity to the close working relationship between government bureaucrats and private industry. In this manner, international trade became a way for private industry to expand its markets, and for the state to regulate a balance between domestic growth and stability.

Finally, in Japan's case, U.S. economic hegemony performed much more poorly than Japan's relative international economic power and domestic regulatory capacity in accounting for relative changes in Japan's international trade. The strength of these last two factors was explained in terms of the Japanese government's efforts to use international trade as a means of maximizing domestic economic growth rather than promoting simple economies of scale and competitive pricing. As a result, there is a close relationship between Japan's relative international economic power, domestic regulatory capacity and Relative Trade. The weakness of U.S. economic hegemony was attributed to the close formal trade networks linking Japanese suppliers and producers. These networks structure much of the trade between Japanese suppliers and Japanese foreign direct investment. Thus, changes in Japan's Relative Trade are less influenced by macro economic shifts at the level of the international system (e.g., changes in U.S. economic hegemony), and more influenced by longstanding relationships between suppliers and producers.

The findings and interpretations presented in this study should be received only after some qualifications. For example, given the fact that this research is placed at the early stages of a development of a more sophisticated explanation of international trade, the reader should realize that the models presented in this study are most likely naive or too simple to accurately model reality. The models assume a unidirectional relationship between the dependent and independent variables. It may be the case that in reality the relationships are hierarchical and/or bidirectional.

It may also be the case that the variables should be arranged along more complex causal paths where some of the independent variables, and perhaps the dependent variable, are employed as intervening variables. However, before these possibilities can be empirically analyzed, a much richer theoretical base is needed.

The purpose of this study has been to initiate a more sophisticated account of relative changes in international trade by employing explanatory factors from both the level of the international system and the level of individual states. This study has shown that models employing specified operational measures of U.S. economic hegemony, relative international economic power, and domestic regulatory capacity as independent variables give a significant account of the changes in the Relative Trade of Britain, France, and Japan when these countries are pooled. It has also been revealed that unspecified factors are at work between the dependent and independent variables which result in unique relationships for each country. Given the dearth of theoretical and empirical work integrating these two levels of analysis, much additional research must be conducted in order to give a fuller account of the structures influencing the trade patterns of countries. In light of this, the empirical findings and theoretical questions surfaced by this study have made an important contribution toward that end.

REFERENCES

REFERENCES

Beck, Nathaniel. 1991. "The Illusion of Cycles in International Relations." International Studies Quarterly 35:455-476.

Conybeare, John A. C. 1987. Trade Wars: The Theory and Practice of International Commercial Rivalry. New York: Columbia University Press.

Cowhey, Peter F. and Edward Long. 1983. "Testing Theories of Regime Change: Hegemonic Decline or Surplus Capacity." International Organization 37:157-88.

Cox, Robert W. 1982. "Production and Hegemony: Toward a Political Economy of World Order." In The Emerging International Economic Order, ed. H. K. Jacobson and D. Sidjanski. Beverly Hills: Sage Publication.

Cox, Robert W. 1987. Production, Power, and World Order: Social Forces in the Making of History. New York: Columbia University Press.

Dosi, Giovanni, Laura D'Andrea Tyson, and John Zysman. 1989. "Trade, Technologies, and Development: A Framework for Discussing Japan." In Politics and Productivity: How Japan's Development Strategy Works, eds. Chalmers Johnson, Laura D'Andrea Tyson, and John Zysman. Berkeley: Harper Business.

Evans, Peter B., Dietrich Rueschemeyer, and Theda Skocpol. 1985. "On the Road toward a More Adequate Understanding of the State." In Bringing the State Back In, eds. Peter B. Evans, Dietrich Rueschemeyer, and Theda Skocpol. New York: Cambridge University Press.

Gerlach, Michael. 1989. "Keiretsu Organization in the Japanese Economy: Analysis and Trade Implications." In Politics and Productivity: How Japan's Development Strategy Works, eds. Chalmers Johnson, Laura D'Andrea Tyson, and John Zysman. Berkeley: Harper Business.

Gill, Stephen 1986. "Hegemony, Consensus and Trilaterialism." Review of International Studies 12(3): 205-22.

Gill, Stephen and David Law 1989. "Global Hegemony and the Structural Power of Capital." International Studies Quarterly 33(4): 475-99.

Gilpin, Robert 1975. U.S. Power and the Multinational Corporation. New York: Basic Books.

Gilpin, Robert 1981. War and Change in World Politics. New York: Cambridge University Press.

Gilpin, Robert 1987. The Political Economy of International Relations. Princeton: Princeton University Press.

Gowa, Joanne. 1989. "Rational Hegemons, Excludable Goods, and Small Groups: An Epitaph for Hegemonic Stability Theory?" World Politics. 41(3): 307-24.

Hamilton, Alexander. 1964. "Reports on Manufacturers." In The Reports of Alexander Hamilton, ed. Jacob E. Cooke. New York: Harper & Row.

International Monetary Fund 1990. International Financial Statistics Yearbook. New York: International Monetary Fund.

Katzenstein, Peter J. 1978. "Conclusion: Domestic Structures and Strategies of Foreign Economic Policy." In Between Power and Plenty: Foreign Economic Policies of Advanced Industrial States, ed. Peter J. Katzenstein. Madison: University of Wisconsin Press.

Kennedy, Peter. 1992. A Guide to Econometrics. 3rd ed. Cambridge: The MIT Press.

Keohane, Robert O. 1984. After Hegemony: Cooperation and Discord in the World Political Economy. Princeton: Princeton University Press.

Kindleberger, Charles P. 1973. The World in Depression, 1929-1939. Berkeley: University of California Press.

Kindleberger, Charles P. 1981. "Dominance and Leadership in the International Economy: Exploitation, Public Goods, and Free Rides." International Studies Quarterly 25(3): 242-54.

Krasner, Stephen D. 1976. "State Power and the Structure of International Trade." World Politics 28: 317-47.

Krasner, Stephen D. 1982. "Structural Causes and Regime Consequences: Regimes as Intervening Variables." International Organization 36(2): 185-206.

Lake, David A. 1988. Power, Protection, and Free trade: International Sources of U.S. Commercial Strategy, 1887-1939. Ithaca: Cornell University Press.

List, Friedrich. [1885] 1966. The National System of the Political Economy. Reprint. New York: August M. Kelly Press.

Maddison, Angus. 1979. "Long Run Dynamics of Productive Growth." Banca Nazionale Del Lavoro Quarterly Review 128(2): 3-44.

Maddison, Angus. 1982. Phases of Capitalist Development. New York: Oxford University Press.

Maddison, Angus. 1987. "Growth and Slowdown in Advanced Capitalist Economies: Techniques of Quantitative Assessment." Journal of Economic Literature 25(4): 649-98.

Maddison, Angus. 1989. The World Economy in the 20th Century. Paris: OECD Publications.

Mansfield, Edward D. 1992. "The Concentration of Capabilities and International Trade." International Organization 46(3): 731-764.

Mastanduno, Michael; David A. Lake; G. John Ikenberry 1989. "Toward a Realist Theory of State Action." International Studies Quarterly. 33(4): 457-74.

McKeown, Timothy J. 1983. "Hegemonic Stability Theory and Neneteenth Century Tariff Levels in Europe." International Organization. 37:73-91.

McKeown, Timothy J. 1984. "Firms and Tariff Regime Change: Explaining the Demand for Protection." World Politics 36(2): 215-33.

Mendenhall, William and Terry Sincich. 1989. A Second Course in Business Statistics: Regression Analysis. 3rd ed. San Francisco: Dellen / Macmillan Inc.

Milner, Helen V. 1988. Resisting Protectionism: Global Industries and the Politics of International Trade. Princeton: Princeton University Press.

Mun, Thomas. [1664] 1949. England's Treasure by Forraign Trade. Reprint. Oxford: Basil Blackwell & Mott.

OECD Economic Outlook. 1991. Historical Statistics. Paris: OECD Publications.

OECD Department of Economics and Statistics. 1991. National Accounts of OECD Countries, vol.1 Main Aggregates. Paris: OECD Publications.

Palan, Ronen. 1992. "The Second Structuralis Theories of International Relations: A Research Note." International Studies Notes of the International Studies Association. 17(3): 22-29.

Pastor, Robert 1980. Congress and the Politics of U.S. Foreign Economic Policy. Berkeley: University of California Press.

Peet, Curtis. 1992. "Declining Hegemony and Rising International Trade: Moving Beyond Hegemonic Stability Theory." International Interactions 18(2): 101-27.

Richards, Diana. 1993. "A Chaotic Model of Power Concentration in the International System." International Studies Quarterly 37(1): 55-72.

Ricardo, David. [1817] 1948. On The Principles of Political Economy and Taxation. Reprint. New York: E.P. Dutton & Co.

Ruggie, John G. 1982. "International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic Order." International Organization 36(2): 379-416.

Russett, Bruce 1985. "The Mysterious Case of Vanishing Hegemony: Or is Mark Twain Really Dead?" International Organization 39(2): 207-32.

Sayrs, Lois W. 1989. Pooled Time Series Analysis. Sage University Paper series on Quantitative Applications in the Social Sciences, series no. 07-070. Beverly Hills: Sage Publications.

Schattschneider, E. E. 1935. Politics, Pressures and the Tariff. Englewood: Printice-Hall.

Smith, Adam. [1776] 1937. An Inquiry into the Nature and Causes of the Wealth of Nations. Reprint. New York: Random House.

Snider, Lewis W. 1987. "Identifying the Elements of State Power: Where Do We Begin?" Comparative Political Studies 20(3): 314-56.

Stein, Authur A. 1984. The Hegemons Dilemma: Great Britain, the United States, and the International Economic Order." International Organization 38:355-86.

Strange, Susan 1979. "The Management of Surplus Capacity: Or How Does Theory Stand up to Protectionism 1970s Style?" International Organization 33:379-416.

Strange, Susan 1985. "Protectionism and World Politics." International Organization 39(2): 233-60.

Strange, Susan 1987. "The Persistent Myth of Lost Hegemony." International Organization 42(2): 551-74.

Terrill, Tom E. 1973. The Tariff, Politics, and American Foreign Policy, 1874-1901. Westport: Greenwood Press.

Wallerstein, Immanuel. 1979. The Capitalis World-Economy. New York: Cambridge University Press.

Webb, Michael C.; Stephen D. Krasner 1989. "Hegemonic Stability Theory: An Empirical Assessment." Review of International Studies 15(2): 183-98.

Zysman, John. 1983. Governments, Markets, and Growth: Financial Systems and the Politics of Industrial Change. Ithaca: Cornell University Press.

Appendix A: Additional Information on Variable Construction

Relative Trade:

Relative Trade was used as the dependent variable for Britain, France, and Japan.

Relative trade = (Exports + Imports) / GDP.

GNP used in calculations for Japan.

Sources: GNP for Japan is taken from OECD Publications, National Accounts of OECD Countries: Main Aggregates, various issues. All other figures are calculated from the International Monetary Fund, International Financial Statistics Yearbook, various issues.

Relative Labor Productivity:

Relative labor productivity was employed as an indicator of the relative international economic power of Britain, France, and Japan; and as an indicator of U.S. economic hegemony.

Relative labor productivity = Country GDP per labor hour / OECD GDP per labor hour.

Sources: Figures for 1950-77 are calculated from Maddison (1979, 43). Figures for 1978-79 are calculated from Maddison (1982, 212). Figures for 1980-89 are calculated based on the following: GDP is from OECD National Accounts, various issues; Employment data is from OECD Labor Force Statistics, 1991, Table 4.0; Labor hours are from Yearbook of Labor Statistics, 1989-90, Chapter 11.

Relative Economic Size:

Relative economic size was employed as an indicator of the relative international economic power of Britain, France, and Japan; and as an indicator of U.S. economic hegemony.

Relative economic size = Country GDP / OECD GDP.

GNP used in calculations for Japan.

Sources: GNP for Japan taken from OECD Publications, National Accounts of OECD Countries: Main Aggregates, various issues. All other figures are calculated from the International Monetary Fund, International Financial Statistics Yearbook, various issues.

Infrastructural Power:

Infrastructural power is employed as an indicator of the domestic regulatory capacity of Britain, France, and Japan.

Infrastructural power = (Total tax revenue / GDP) X (direct taxes / indirect taxes).

GNP used in calculations for Japan.

Sources: GNP for Japan and tax figures for all countries are derived from OECD Publications, National Accounts: Main Aggregates, various issues. GDP for France and U.K. are from International Monetary Fund, International Financial Statistics Yearbook, various issues.

Relative Domestic Transfer Payments:

Relative domestic transfer payments is employed as an indicator of the domestic regulatory capacity of Britain, France, and Japan.

Relative domestic transfer payments = (Social security benefits + social assistance grants + transfers to non-profit institutions serving households) / GDP.

GNP used in calculations for Japan.

Sources: OECD Publications, National Accounts: Detailed Tables, Vol. II, various years.

Appendix B: Residual Plots to Supplement Tables

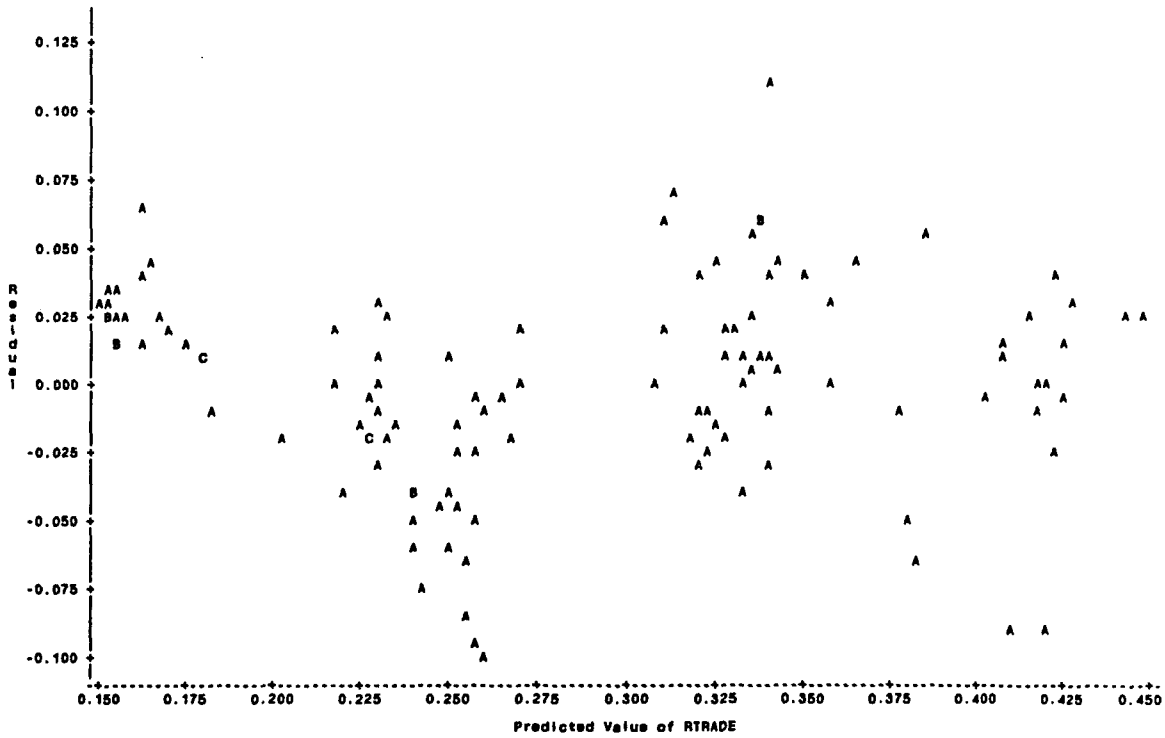

Figure B.1. Residuals By Predicted Plot to Supplement Table 1
A = 1 Observation, B = 2 Observations, etc.

$$\text{Pooled Rel Trade}_t = \beta_0 D_{\text{Britain}} + \beta_0 D_{\text{France}} + \beta_0 D_{\text{Japan}} + \beta_1 \text{US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{Pooled RLP}_t + \beta_4 (\text{Pooled RLP})^2_t + \beta_5 (\text{Pooled RLP})^3_t + \beta_6 \text{Pooled INFPOW}_t + \beta_7 (\text{Pooled INFPOW})^2_t + \beta_8 (\text{Pooled INFPOW})^3_t$$

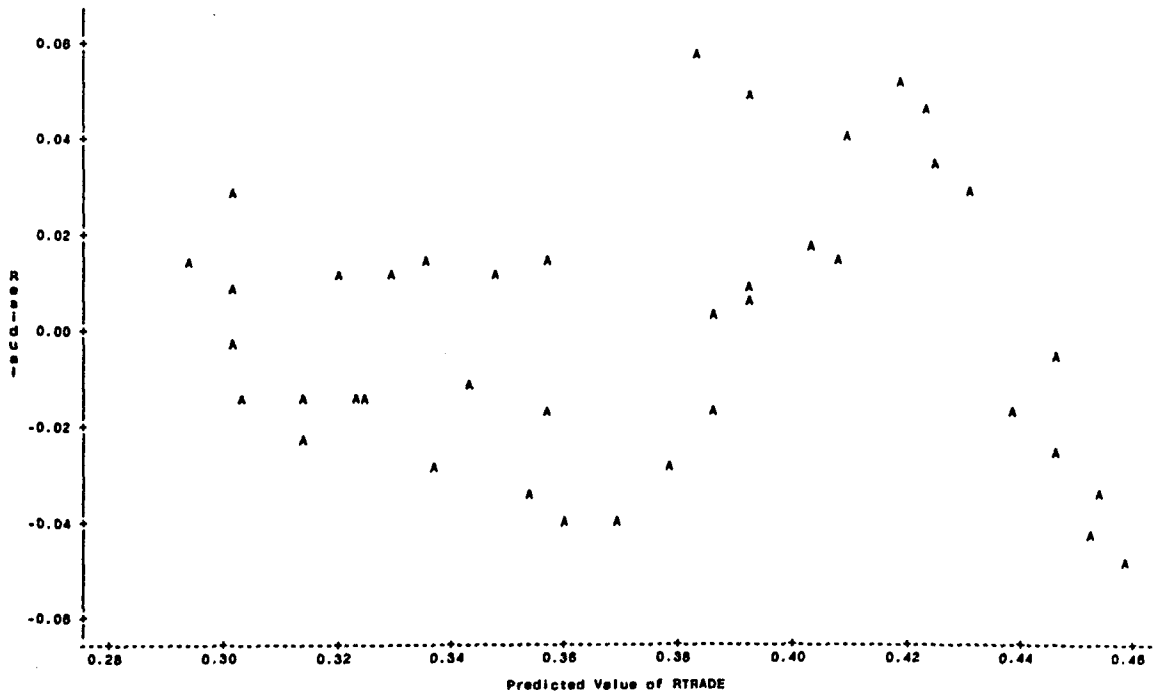

Figure B.2. Residuals By Predicted Plot to Supplement Table 2

A = 1 Observation, B = 2 Observations, etc.

$$\text{Britain's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ Britain's RLP}_t + \beta_4 (\text{Britain's RLP})^2_t + \beta_5 \text{ Britain's INFPOW}_t + \beta_6 (\text{Britain's INFPOW})^2_t$$

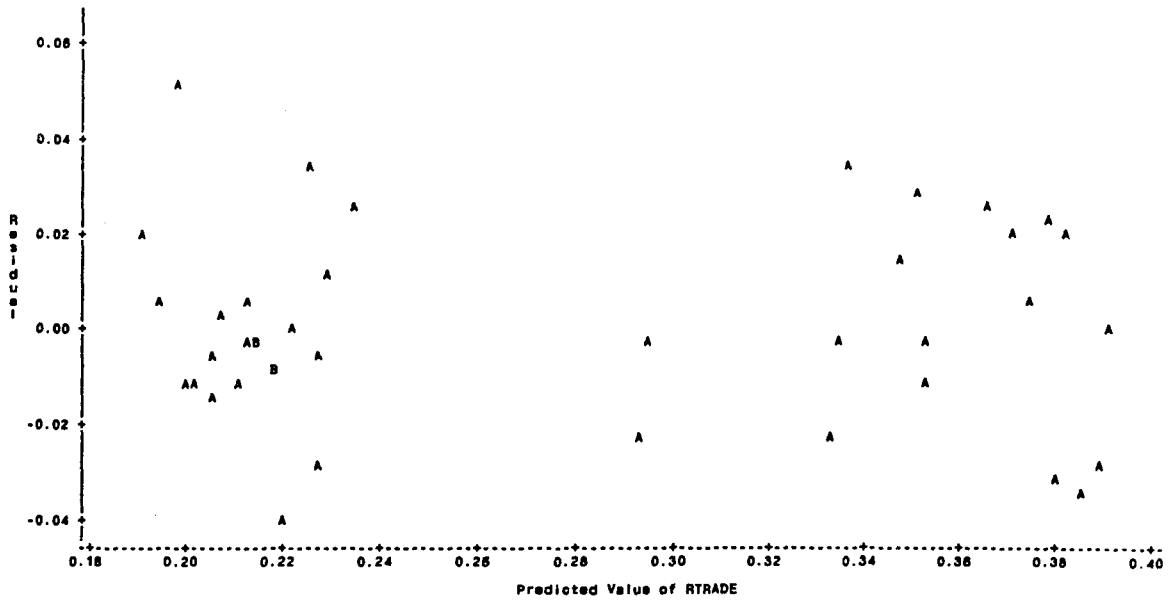

Figure B.3. Residuals By Predicted Plot to Supplement Table 3

A = 1 Observation, B = 2 Observations, etc.

France's Rel Trade$_t$ = β_0 + β_1 US RLP$_t$ + β_2 (US RLP)^2_t + β_3 France's RLP$_t$ + β_4 (France's RLP)^2_t + β_5 France's INFPOW$_t$ + β_6 (France's INFPOW)^2_t

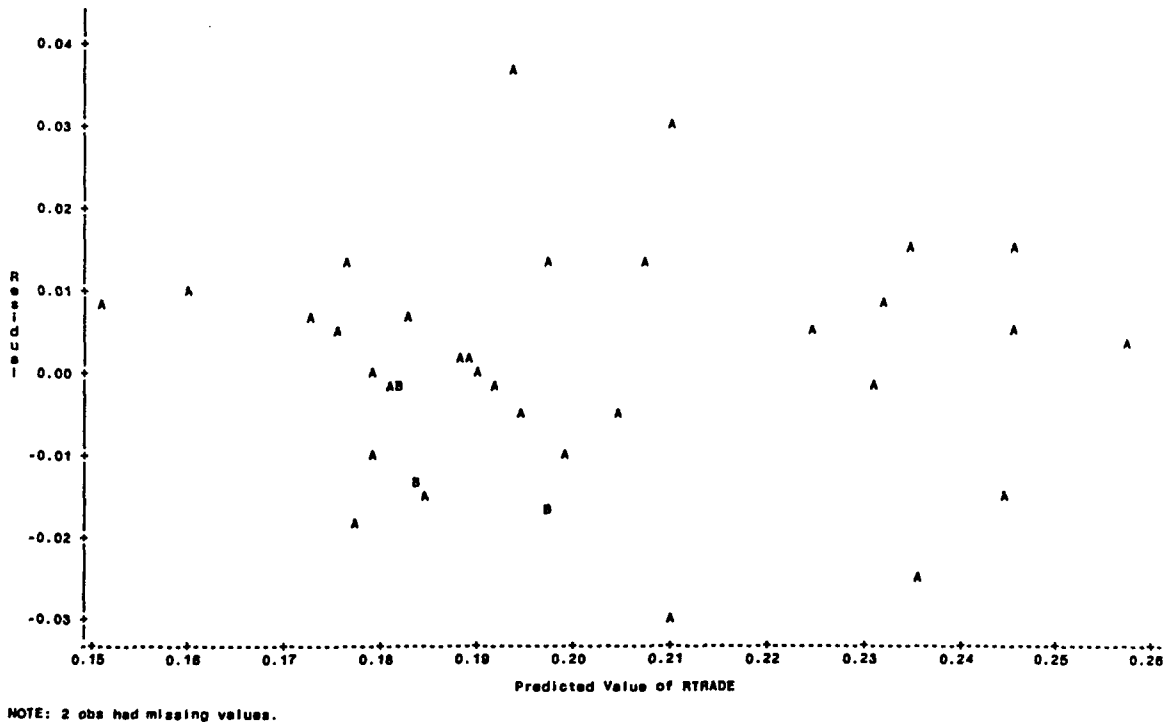

Figure B.4. Residual By Predicted Plot to Supplement Table 4

A = 1 Observation, B = 2 Observations, etc.

Japan's Rel Trade$_t$ = β_0 + β_1 US RLP$_t$ + β_2 (US RLP)^2_t + β_3 Japan's RLP$_t$ + β_4 (Japan's RLP)^2_t + β_5 (Japan's RLP)^3_t + β_6 Japan's INFPOW$_t$ + β_7 (Japan's INFPOW)^2_t + β_8 (Japan's INFPOW)^3_t

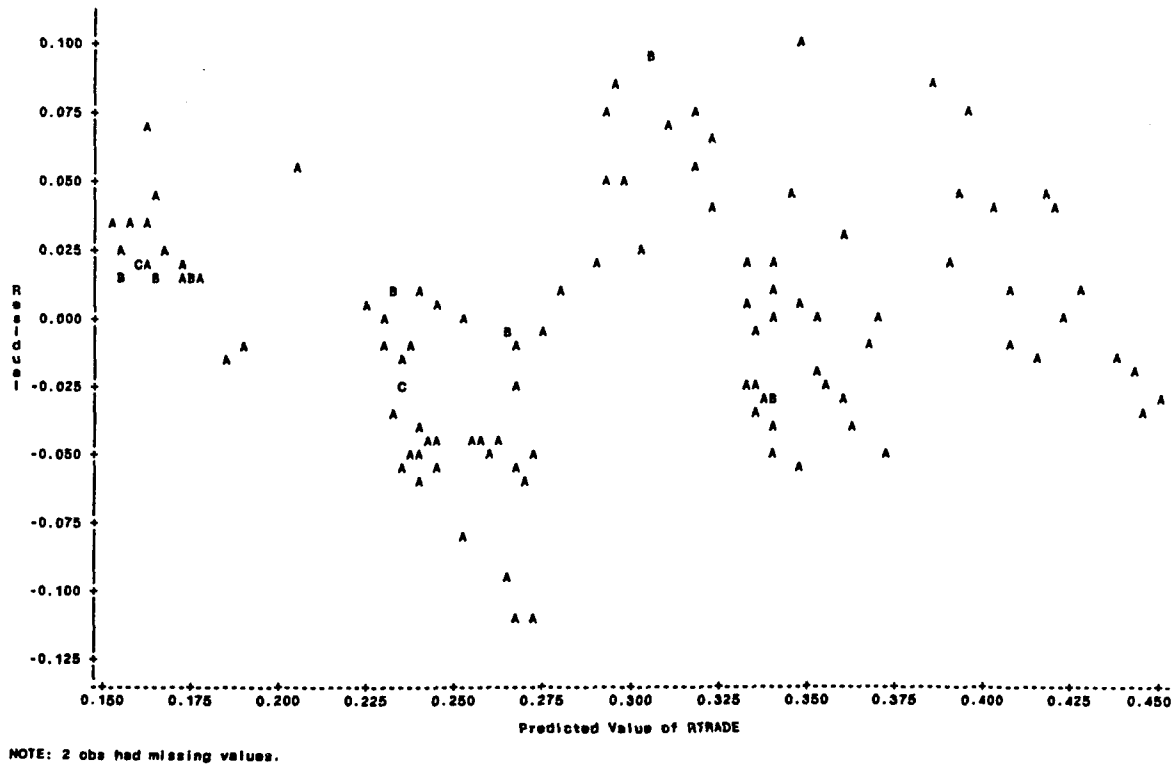

Figure B.5. Residuals By Predicted Plot to Supplement Table 5

A = 1 Observation, B = 2 Observations, etc.

Pooled Rel Trade$_t$ = β_0 $D_{Britain}$ + β_0 D_{France} + β_0 D_{Japan} + β_1 US RLP$_t$ + β_2 (US RLP)^2_t + β_3 Pooled RLP$_t$ + β_4 (Pooled RLP)^2_t + β_5 (Pooled RLP)^3_t + β_6 Pooled DOMTRAN$_t$ + β_7 (Pooled DOMTRAN)^2_t + β_8 (Pooled DOMTRAN)^3_t

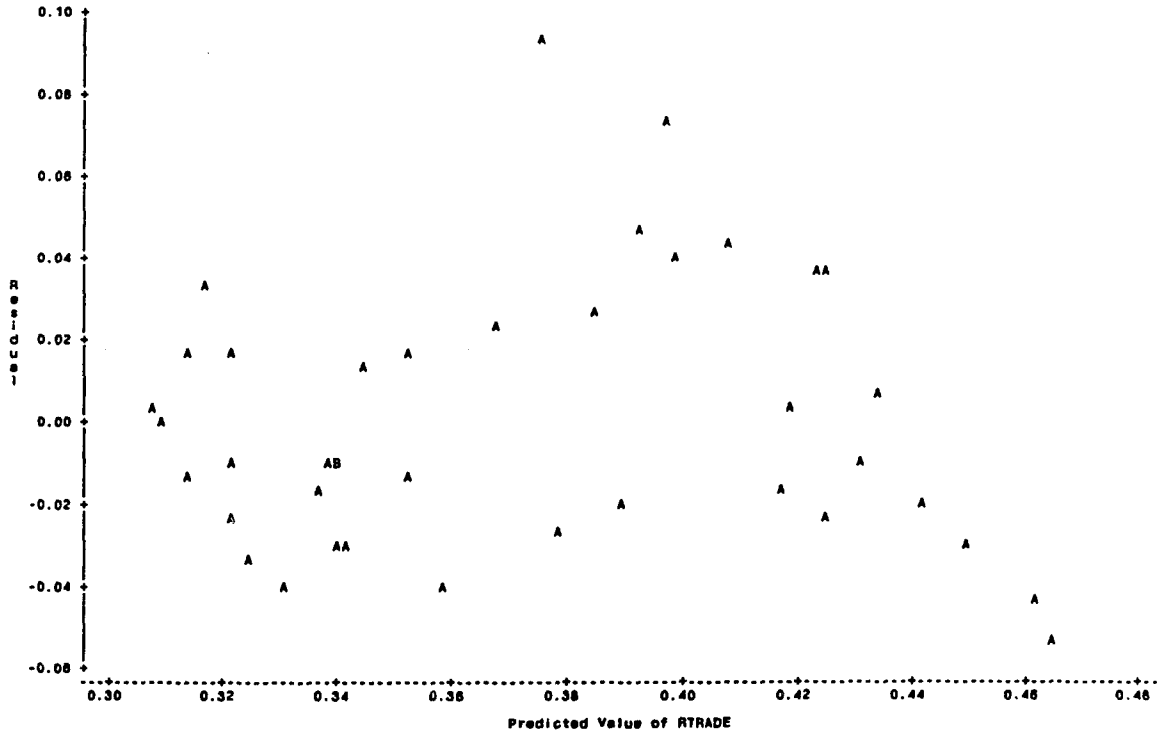

Figure B.6. Residuals By Predicted Plot to Supplement Table 6

A = 1 Observation, B = 2 Observations, etc.

$$\text{Britain's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ Britain's RLP}_t + \beta_4 (\text{Britain's RLP})^2_t + \beta_5 \text{ Britain's DOMTRAN}_t + \beta_6 (\text{Britain's DOMTRAN})^2_t$$

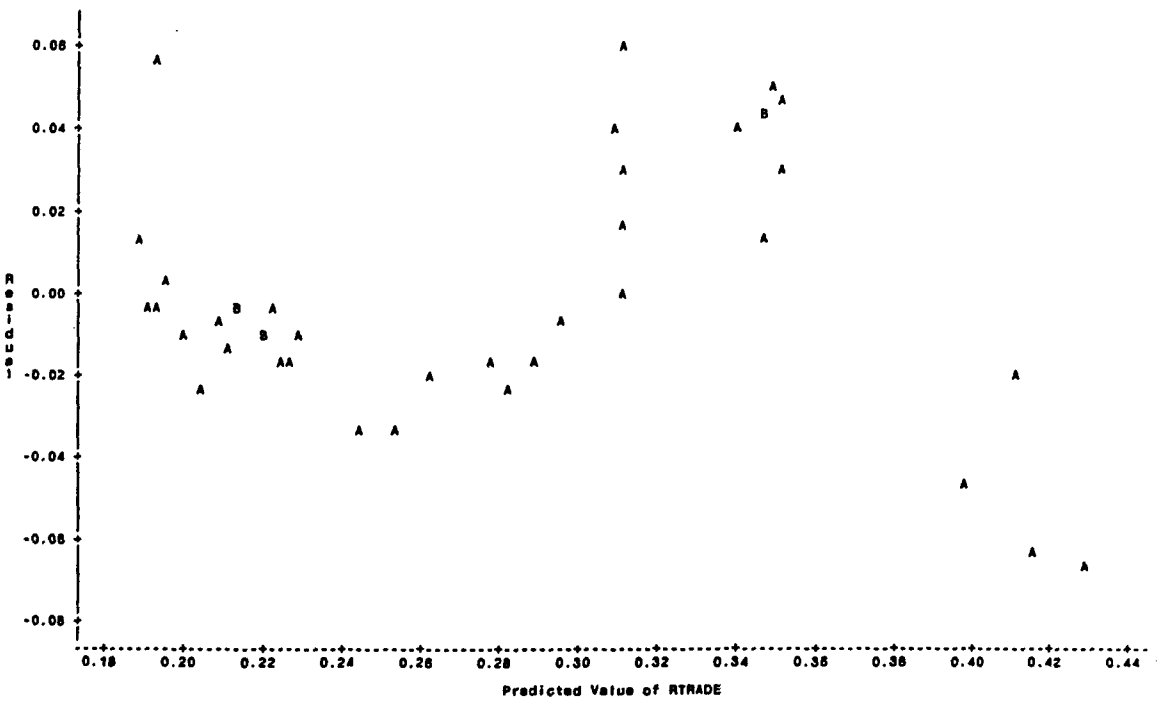

Figure B.7. Residuals By Predicted Plot to Supplement table 7

A = 1 Observation, B = 2 Observations, etc.

France's Rel Trade$_t$ = β_0 + β_1 US RLP$_t$ + β_2 (US RLP)^2_t + β_3 France's RLP$_t$ + β_4 (France's RLP)^2_t + β_5 France's DOMTRAN$_t$ + β_6 (France's DOMTRAN)^2_t

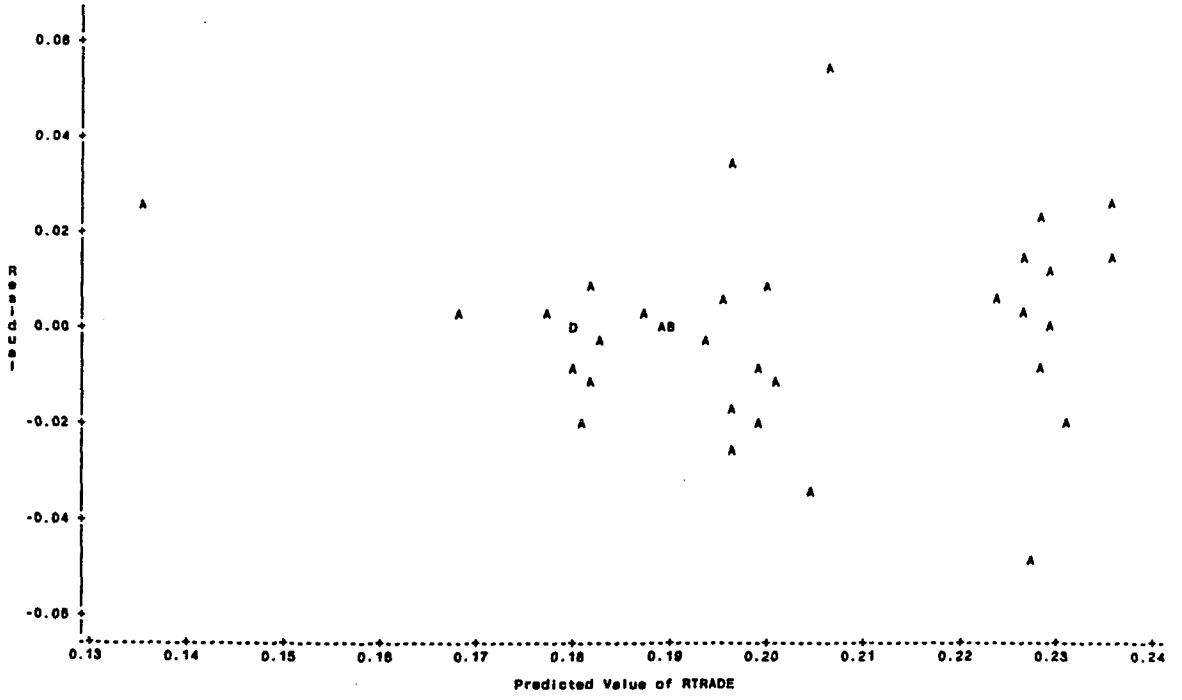

Figure B.8. Residuals By Predicted Plot to Supplement Table 8

A = 1 Observation, B = 2 Observations, etc.

$$\text{Japan's Rel Trade}_t = \beta_0 + \beta_1 \text{ US RLP}_t + \beta_2 (\text{US RLP})^2_t + \beta_3 \text{ Japan's RLP}_t + \beta_4 (\text{Japan's RLP})^2_t + \beta_5 (\text{Japan's RLP})^3_t + \beta_6 \text{ Japan's DOMTRAN}_t + \beta_7 (\text{Japan's DOMTRAN})^2_t + \beta_8 (\text{Japan's DOMTRAN})^3_t$$

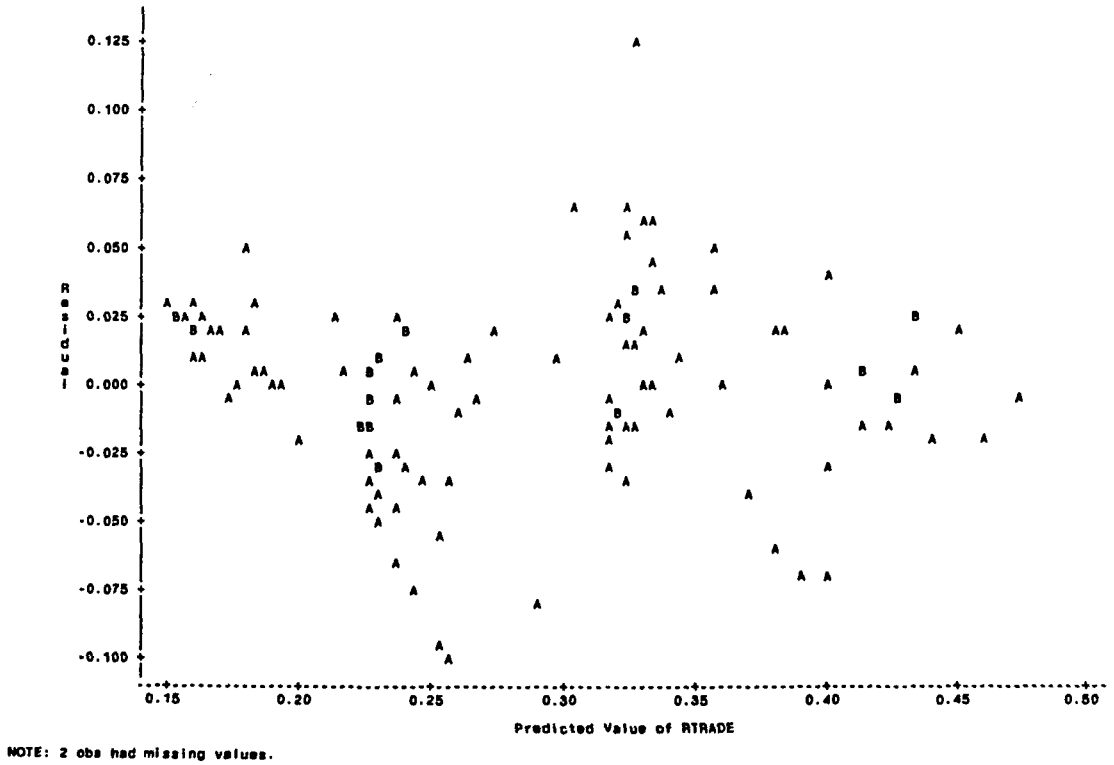

Figure B.9. Residuals By Predicted Plot to Supplement Table 9

A = 1 Observation, B = 2 Observations, etc.

$$\text{Pooled Rel Trade}_t = \beta_0 D_{\text{Britain}} + \beta_0 D_{\text{France}} + \beta_0 D_{\text{Japan}} + \beta_1 \text{ US RECSIZE}_t + \beta_2 (\text{US RECSIZE})^2_t + \beta_3 \text{ Pooled RECSIZE}_t + \beta_4 (\text{Pooled RECSIZE})^2_t + \beta_5 (\text{Pooled RECSIZE})^3_t + \beta_6 \text{ Pooled INFPOW}_t + \beta_7 (\text{Pooled INFPOW})^2_t + \beta_8 (\text{Pooled INFPOW})^3_t$$

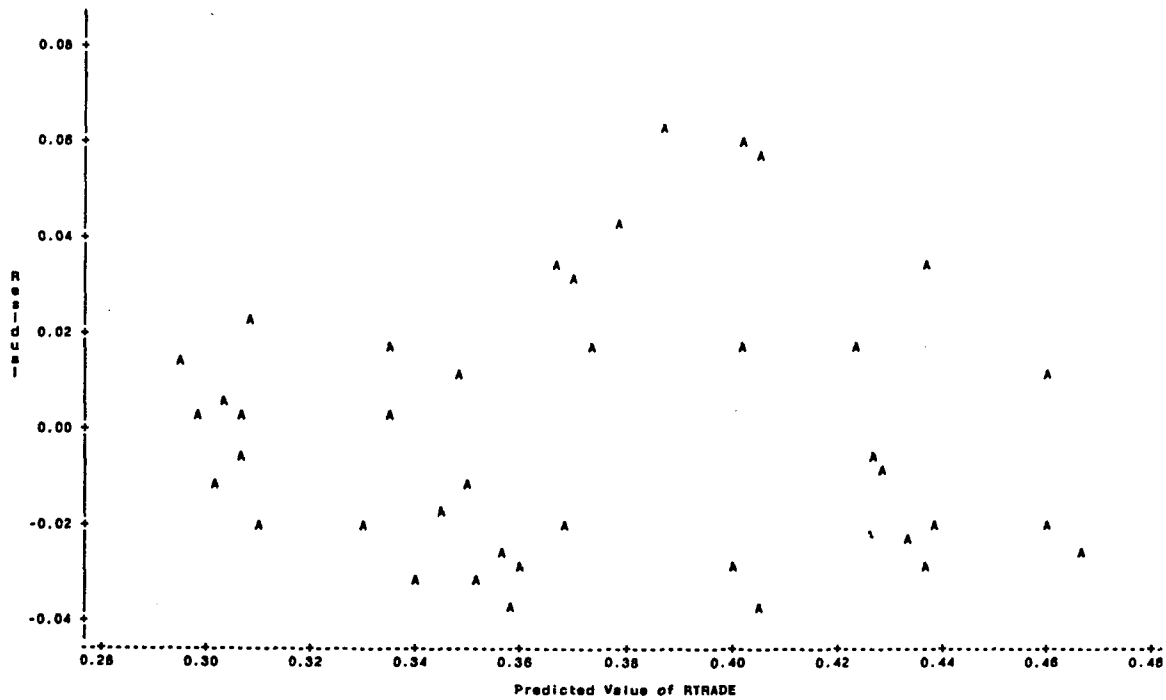

Figure B.10. Residuals By Predicted Plot to Supplement Table 10

A = 1 Observation, B = 2 Observations, etc.

Britain's Rel Trade$_t$ = β_0 + β_1 US RECSIZE$_t$ + β_2 (US RECSIZE)^2_t + β_3 Britain's RECSIZE$_t$ + β_4 (Britain's RECSIZE)^2_t + β_5 Britain's INFPOW$_t$ + β_6 (Britain's INFPOW)^2_t

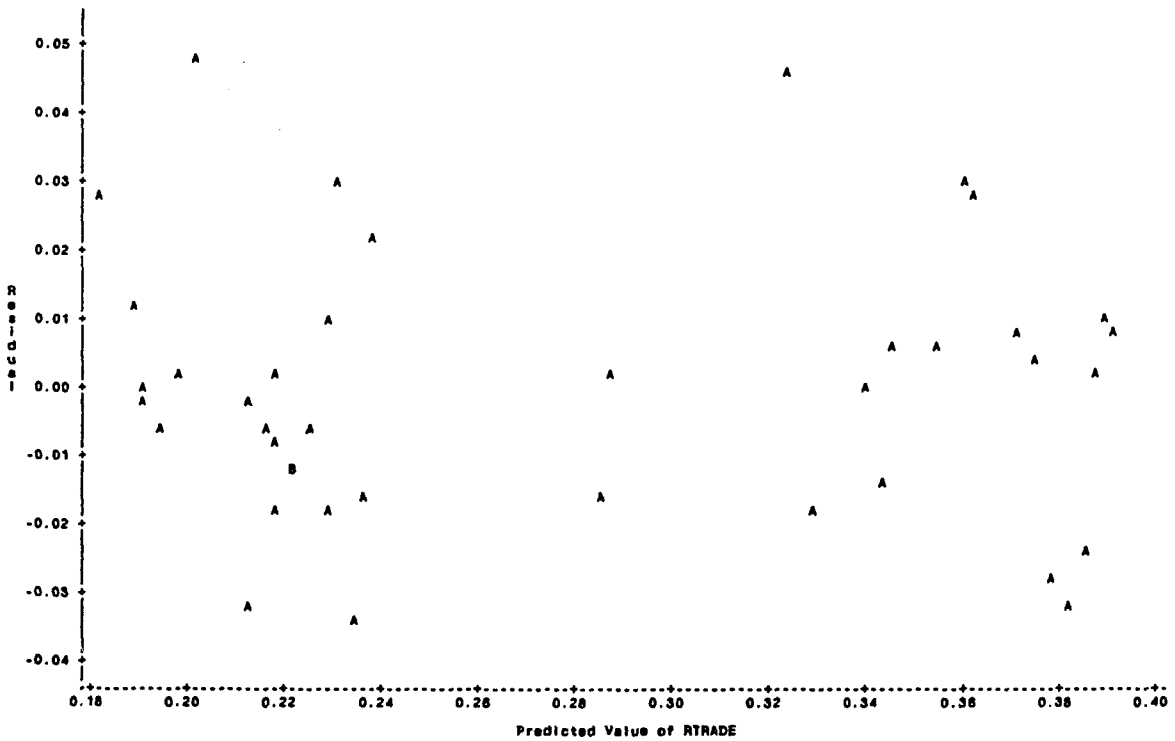

Figure B.11. Residuals By Predicted Plot to Supplement Table 11

A = 1 Observation, B = 2 Observations, etc.

France's Rel Trade$_t$ = β_0 + β_1 US RECSIZE$_t$ + β_2 (US RECSIZE)^2_t + β_3 France's RECSIZE$_t$ + β_4 (France's RECSIZE)^2_t + β_5 France's INFPOW$_t$ + β_6 (France's INFPOW)^2_t

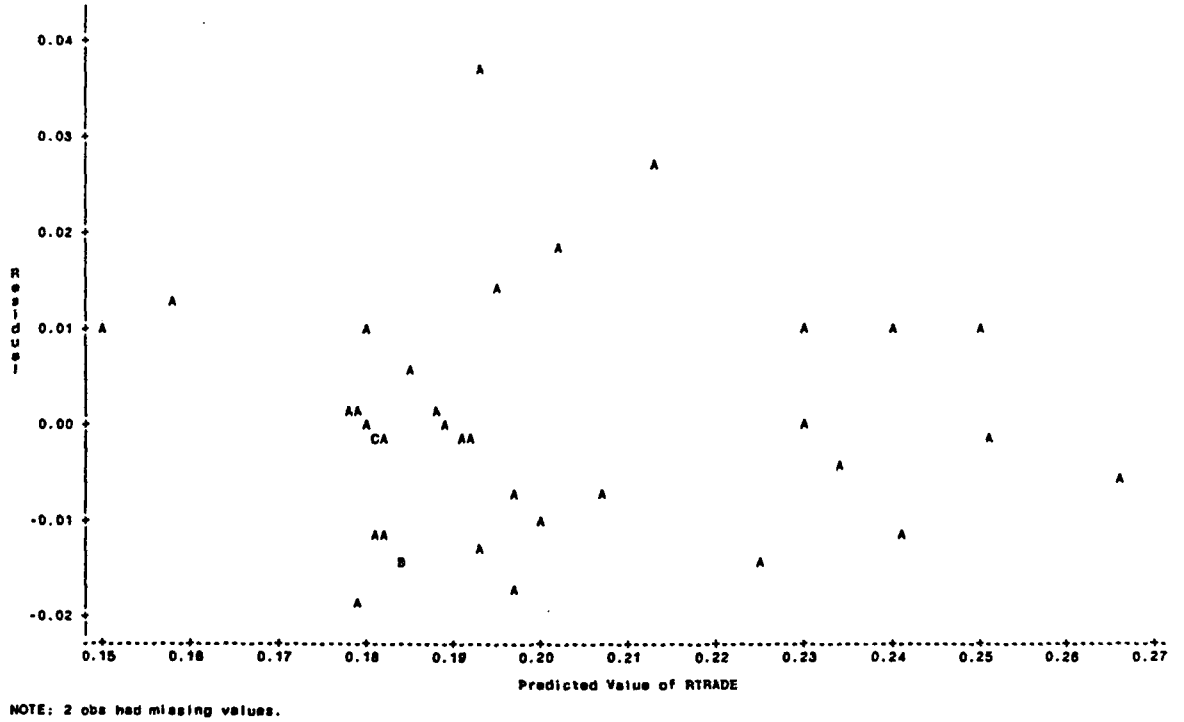

Figure B.12. Residuals By Predicted Plot to Supplement Table 12

A = 1 Observation, B = 2 Observations, etc.

Japan's Rel Trade$_t$ = β_0 + β_1 US RECSIZE$_t$ + β_2 (US RECSIZE)^2_t + β_3 Japan's RECSIZE$_t$ + β_4 (Japan's RECSIZE)^2_t + β_5 (Japan's RECSIZE)^3_t + β_6 Japan's INFPOW$_t$ + β_7 (Japan's INFPOW)^2_t + β_8 (Japan's INFPOW)^3_t

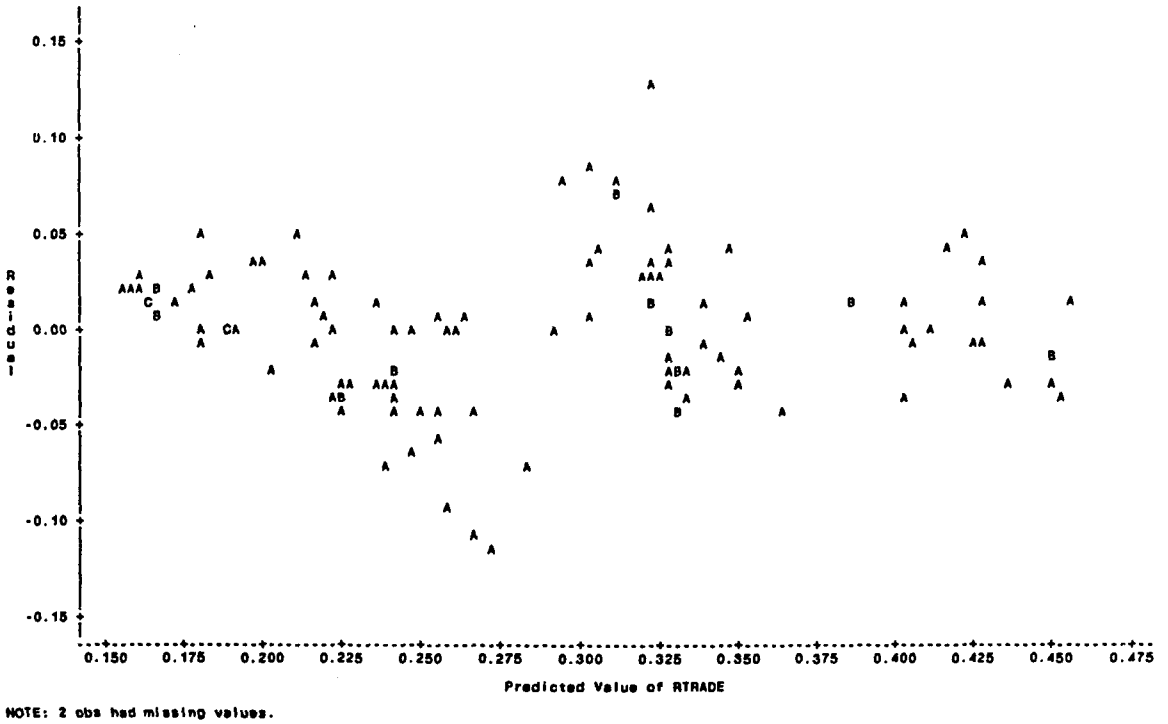

Figure B.13. Residuals By Predicted Plot to Supplement Table 13

A = 1 Observation, B = 2 Observations, etc.

$$\text{Pooled Rel Trade}_t = \beta_0 D_{\text{Britain}} + \beta_0 D_{\text{France}} + \beta_0 D_{\text{Japan}} + \beta_1 \text{US RECSIZE}_t + \beta_2 (\text{US RECSIZE})^2_t + \beta_3 \text{Pooled RECSIZE}_t + \beta_4 (\text{Pooled RECSIZE})^2_t + \beta_5 (\text{Pooled RECSIZE})^3_t + \beta_6 \text{Pooled DOMTRAN}_t + \beta_7 (\text{Pooled DOMTRAN})^2_t + \beta_8 (\text{Pooled DOMTRAN})^3_t$$

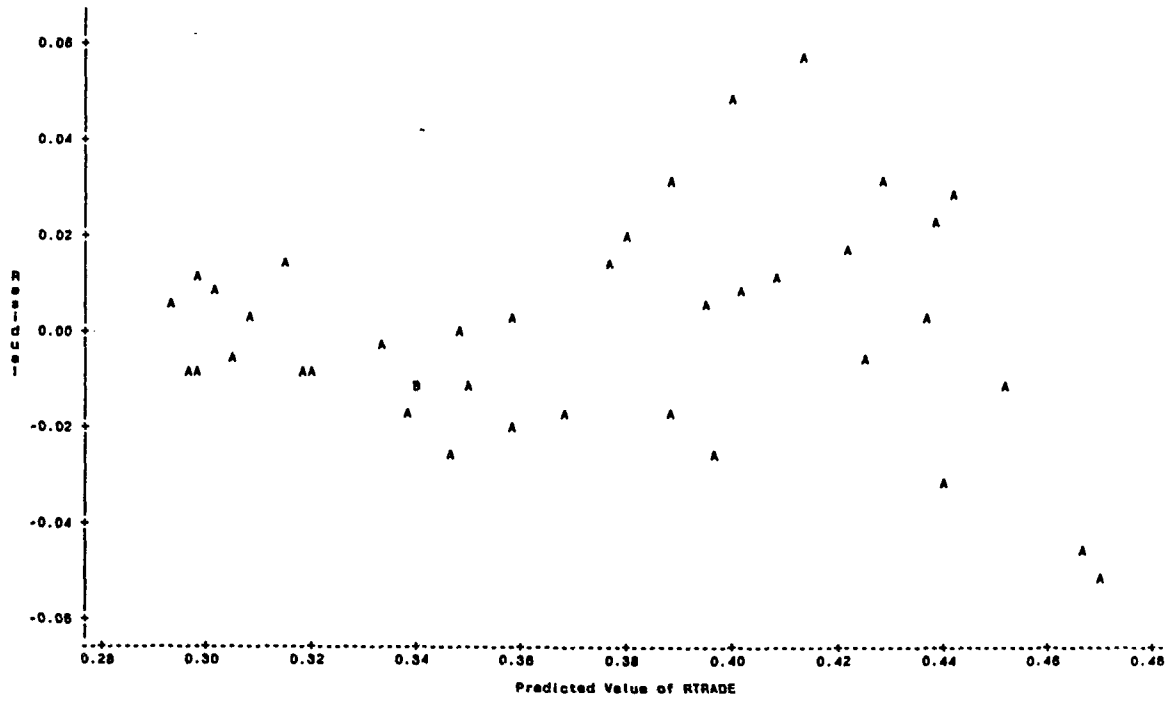

Figure B.14. Residuals By Predicted Plot to Supplement Table 14

A = 1 Observation, B = 2 Observations, etc.

Britain's Rel Trade$_t$ = β_0 + β_1 US RECSIZE$_t$ + β_2 (US RECSIZE)^2_t + β_3 Britain's RECSIZE$_t$ + β_4 (Britain's RECSIZE)^2_t + β_5 Britain's DOMTRAN$_t$ + β_6 (Britain's DOMTRAN)^2_t

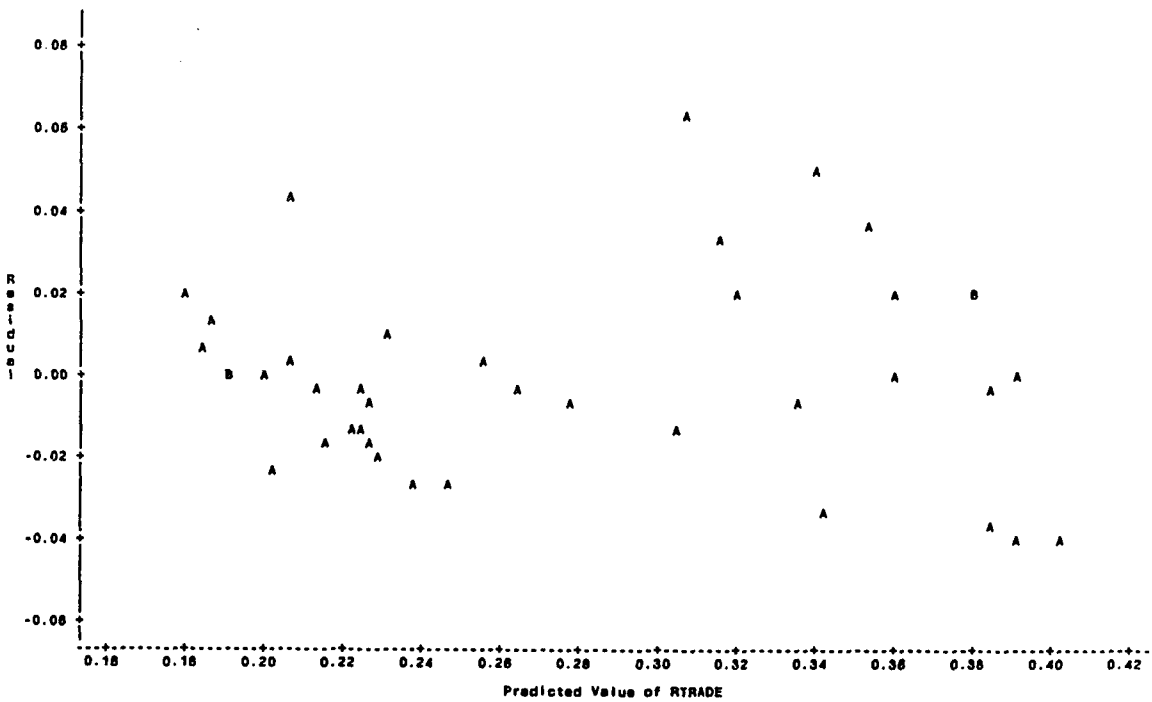

Figure B.15. Residuals By Predicted Plot to Supplement Table 15

A = 1 Observation, B = 2 Observations, etc.

France's Rel Trade$_t$ = β_0 + β_1 US RECSIZE$_t$ + β_2 (US RECSIZE)^2_t + β_3 France's RECSIZE$_t$ + β_4 (France's RECSIZE)^2_t + β_5 France's DOMTRAN$_t$ + β_6 (France's DOMTRAN)^2_t

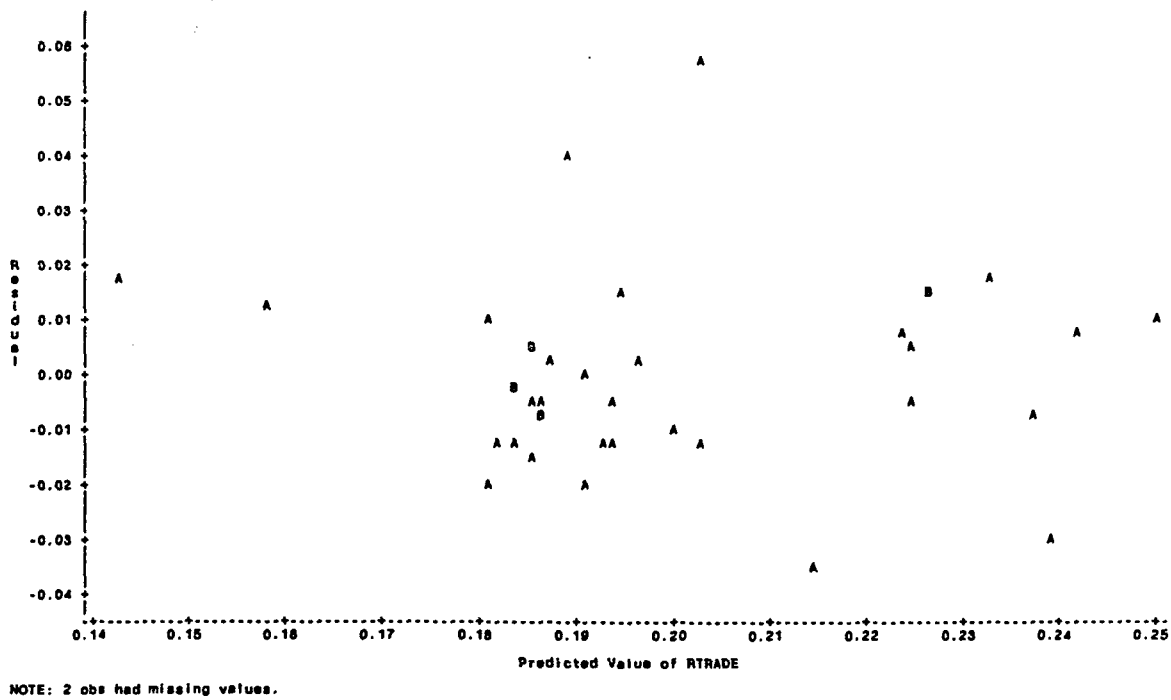

Figure B.16. Residuals By Predicted Plot to Supplement Table 16

A = 1 Observation, B = 2 Observations, etc.

Japan's Rel Trade$_t$ = β_0 + β_1 US RECSIZE$_t$ + β_2 (US RECSIZE)^2_t + β_3 Japan's RECSIZE$_t$ + β_4 (Japan's RECSIZE)^2_t + β_5 (Japan's RECSIZE)^3_t + β_6 Japan's DOMTRAN$_t$ + β_7 (Japan's DOMTRAN)^2_t + β_8 (Japan's DOMTRAN)^3_t

Appendix C: SAS Printouts to Supplement Tables

Printout to Supplement Table 1

NOTE: No intercept in model. R-square is redefined.
Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	0.43480	0.03953	66.401	0.0001
Error	105	0.06250	0.00060		
U Total	116	0.49730			

Root MSE	0.02440	R-square	0.8743
Dep Mean	0.05526	Adj R-sq	0.8611
C.V.	44.15238		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Dummy Britain	1	0.063498	0.00443475	14.318	0.0001	0.210159	0.122038	0.77609590	1.28850056
Dummy France	1	0.049153	0.00415853	11.820	0.0001	0.113490	0.083163	0.86055327	1.16204311
Dummy Japan	1	0.032007	0.00431583	7.416	0.0001	0.054232	0.032740	0.86375049	1.15774175
US RLP	1	-0.031702	0.00797207	-3.977	0.0001	0.020975	0.009414	0.60002210	1.66660527
US RLP^2	1	0.011176	0.00640310	1.745	0.0839	0.000211	0.001813	0.65849980	1.51880334
Pooled RLP	1	-0.020562	0.01072615	-1.917	0.0580	0.006220	0.002187	0.38729714	2.58199684
Pooled RLP^2	1	-0.002948	0.00544985	-0.541	0.5897	0.000178	0.000174	0.27438161	3.64455911
Pooled RLP^3	1	-0.000898	0.00243530	-0.368	0.7136	0.000961	0.000080648	0.20099655	4.97520975
Pooled INFPOW	1	0.055480	0.00945380	5.869	0.0001	0.007211	0.020501	0.40793523	2.45136953
Pooled INFPOW^2	1	0.022720	0.00592364	3.836	0.0002	0.000093008	0.008757	0.33582899	2.97770597
Pooled INFPOW^3	1	-0.016891	0.00283920	-5.949	0.0001	0.021069	0.021069	0.27365073	3.65429319

RHO OF .805873 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 62 Chisq Value: 59.9567 Prob>Chisq: 0.5499

Durbin-Watson D	2.074
(For Number of Obs.)	116
1st Order Autocorrelation	-0.089

Printout to Supplement Table 2

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	0.01707	0.00285	3.717	0.0065
Error	32	0.02450	0.00077		
C Total	38	0.04157			

Root MSE	0.02767	R-square	0.4107
Dep Mean	0.12275	Adj R-sq	0.3002
C.V.	22.54020		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.109546	0.00618391	17.715	0.0001	0.587605	0.240217	.	0.00000000
US RLP	1	0.024492	0.01669121	1.467	0.1520	0.001671	0.001648	0.56327515	1.77533129
US RLP^2	1	0.036112	0.01191453	3.031	0.0048	0.003464	0.007032	0.72834509	1.37297554
Britain RLP	1	-0.061317	0.02820958	-2.174	0.0372	0.009961	0.003617	0.25738535	3.88522505
Britain RLP^2	1	-0.006325	0.01529887	-0.413	0.6820	0.000503	0.000131	0.38166892	2.62008560
Britain INFPOW	1	0.015026	0.01316780	1.141	0.2623	0.001259	0.000997	0.42272647	2.36559592
Britain INFPOW^2	1	-0.000809	0.00568152	-0.142	0.8876	0.000015528	0.000015528	0.67549451	1.48039694

RHO OF .673078 INSERTED IN FORMULA

Test of First and Second Moment Specification

DF: 27 Chisq Value: 28.0913 Prob>Chisq: 0.4063

Durbin-Watson D	1.874
(For Number of Obs.)	39
1st Order Autocorrelation	0.049

Printout to Supplement Table 3

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	0.11447	0.01908	42.026	0.0001
Error	33	0.01498	0.00045		
C Total	39	0.12945			

Root MSE	0.02131	R-square	0.8843
Dep Mean	0.18877	Adj R-sq	0.8632
C.V.	11.28692		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.188143	0.00872841	21.555	0.0001	1.425419	0.210930	.	0.00000000
US RLP	1	-0.021634	0.01423170	-1.520	0.1380	0.082476	0.001049	0.10388210	9.62629790
US RLP^2	1	0.007688	0.00693640	1.108	0.2757	0.002162	0.000558	0.57344261	1.74385366
France RLP	1	-0.014353	0.01469041	-0.977	0.3357	0.000755	0.000433	0.10168319	9.83446700
France RLP^2	1	-0.000594	0.00532367	-0.112	0.9119	0.000329	0.000005646	0.31713461	3.15323519
France $INFPOW_2$	1	0.071570	0.01252544	5.714	0.0001	0.028595	0.014822	0.14798975	6.75722454
France $INFPOW^2$	1	-0.006440	0.01105903	-0.582	0.5643	0.000154	0.000154	0.38100811	2.62461608

RHO OF .673076 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 27 Chisq Value: 33.2562 Prob>Chisq: 0.1887

Durbin-Watson D	1.934
(For Number of Obs.)	40
1st Order Autocorrelation	0.026

Printout to Supplement Table 4

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	0.01866	0.00233	9.466	0.0001
Error	28	0.00690	0.00025		
C Total	36	0.02556			

Root MSE	0.01570	R-square	0.7301
Dep Mean	0.16486	Adj R-sq	0.6529
C.V.	9.52127		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.160371	0.00856017	18.735	0.0001	1.005571	0.088475	.	0.00000000
US RLP	1	-0.014228	0.01810807	-0.786	0.4386	0.000616	0.000152	0.03634892	27.51113689
US RLP^2	1	0.007182	0.01021106	0.703	0.4876	0.000084061	0.000122	0.17053939	5.86374780
Japan RLP	1	-0.055767	0.02904619	-1.920	0.0651	0.000627	0.000908	0.01200688	83.28560476
Japan RLP^2	1	-0.021859	0.02174187	-1.005	0.3233	0.008330	0.000249	0.01199579	83.36259155
Japan RLP^3	1	0.004068	0.00800886	0.508	0.6154	0.002766	0.000063575	0.01524714	65.58606496
Japan INFPOW	1	0.074990	0.01859026	4.034	0.0004	0.004058	0.004009	0.02784763	35.90970018
Japan INFPOW^2	1	0.030539	0.01421613	2.148	0.0405	0.000119	0.001137	0.05210218	19.19305312
Japan INFPOW^3	1	-0.020076	0.00694603	-2.890	0.0074	0.002058	0.002058	0.04303100	23.23905977

RHO OF .173016 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 34 Chisq Value: 34.3870 Prob>Chisq: 0.4492

Durbin-Watson D	1.793
(For Number of Obs.)	37
1st Order Autocorrelation	0.097

Printout to Supplement Table 5

NOTE: No intercept in model. R-square is redefined.
Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	0.47714	0.04338	55.162	0.0001
Error	105	0.08257	0.00079		
U Total	116	0.55971			

Root MSE	0.02804	R-square	0.8525
Dep Mean	0.05963	Adj R-sq	0.8370
C.V.	47.02265		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Dummy Britain	1	0.073598	0.00519364	14.170	0.0001	0.244130	0.157898	0.74748783	1.33781443
Dummy France	1	0.058004	0.00493008	11.765	0.0001	0.132447	0.108847	0.80880644	1.23638976
Dummy Japan	1	0.039715	0.00515782	7.700	0.0001	0.063291	0.046623	0.79887431	1.25176137
US RLP$_2$	1	-0.013117	0.01266008	-1.036	0.3025	0.021501	0.000844	0.30596927	3.26830208
US RLP^2	1	0.012354	0.00773949	1.596	0.1134	0.000175	0.002004	0.57625822	1.73533317
Pooled RLP$_2$	1	-0.011931	0.01210990	-0.985	0.3268	0.005838	0.000763	0.38783173	2.57843782
Pooled RLP^2	1	0.002654	0.00647251	0.410	0.6826	0.000234	0.000132	0.25616297	3.90376490
Pooled RLP^3	1	-0.002871	0.00289133	-0.993	0.3231	0.001106	0.000775	0.19004858	5.26181244
Pooled DOMTRAN$_2$	1	0.040727	0.01847543	2.204	0.0297	0.007103	0.003821	0.17010021	5.87888734
Pooled DOMTRAN^2	1	-0.011048	0.00876534	-1.260	0.2103	0.001294	0.001249	0.49845774	2.00618811
Pooled DOMTRAN^3	1	-0.001202	0.00711472	-0.169	0.8662	0.000022443	0.000022443	0.20295502	4.92720025

RHO OF .790502 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 62 Chisq Value: 64.0221 Prob>Chisq: 0.4054

Durbin-Watson D	2.028
(For Number of Obs.)	116
1st Order Autocorrelation	-0.054

Printout to Supplement Table 6

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	0.01348	0.00225	2.792	0.0268
Error	32	0.02574	0.00080		
C Total	38	0.03921			

Root MSE	0.02836	R-square	0.3437
Dep Mean	0.09906	Adj R-sq	0.2208
C.V.	28.62935		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.086884	0.00658514	13.194	0.0001	0.382687	0.140007	.	0.00000000
US RLP_2	1	0.017138	0.02447087	0.700	0.4888	0.000660	0.000394	0.36936752	2.70733059
US RLP^2	1	0.029559	0.01322029	2.236	0.0325	0.003325	0.004021	0.66978991	1.49300548
Britain RLP_2	1	-0.066710	0.02856970	-2.335	0.0260	0.009151	0.004385	0.35936710	2.78266987
Britain RLP^2	1	-0.007452	0.01378701	-0.540	0.5926	0.000201	0.000235	0.47729223	2.09515247
Britain $DOMTRAN_2$	1	0.002025	0.03056049	0.066	0.9476	0.000058347	0.000003531	0.27082687	3.69239579
Britain $DOMTRAN^2$	1	0.005448	0.01730648	0.315	0.7550	0.000079697	0.000079697	0.51084579	1.95753792

RHO OF .736835 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 27 Chisq Value: 30.3808 Prob>Chisq: 0.2973

Durbin-Watson D	1.883
(For Number of Obs.)	39
1st Order Autocorrelation	0.050

Printout to Supplement Table 7

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	0.04503	0.00751	11.513	0.0001
Error	33	0.02151	0.00065		
C Total	39	0.06654			

Root MSE	0.02553	R-square	0.6767
Dep Mean	0.08028	Adj R-sq	0.6179
C.V.	31.80949		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.073535	0.00593327	12.394	0.0001	0.257692	0.100128	.	0.00000000
US RLP	1	-0.031628	0.01826049	-1.732	0.0926	0.035751	0.001955	0.17693715	5.65172437
US RLP^2	1	0.019225	0.01177910	1.632	0.1122	0.000002533	0.001736	0.58956420	1.69616812
France RLP	1	-0.015055	0.01682903	-0.895	0.3775	0.001629	0.000522	0.25034379	3.99450691
France RLP^2	1	-0.000174	0.00591891	-0.029	0.9767	0.000319	0.000000568	0.40146366	2.49088546
France DOMTRAN	1	0.049143	0.01598045	3.075	0.0042	0.007179	0.006165	0.26457824	3.77960025
France DOMTRAN^2	1	0.005222	0.01090050	0.479	0.6351	0.000150	0.000150	0.57587499	1.73648799

RHO OF .708845 INSERTED IN FORMULA

Test of First and Second Moment Specification

DF: 27 Chisq Value: 23.8614 Prob>Chisq: 0.6380

Durbin-Watson D	1.885
(For Number of Obs.)	40
1st Order Autocorrelation	0.038

Printout to Supplement Table 8

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	0.01511	0.00189	4.256	0.0019
Error	28	0.01242	0.00044		
C Total	36	0.02753			

Root MSE	0.02106	R-square	0.5488
Dep Mean	0.17739	Adj R-sq	0.4198
C.V.	11.87363		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.179467	0.01576327	11.385	0.0001	1.164324	0.057506	.	0.00000000
US RLP_2	1	-0.004990	0.02397091	-0.208	0.8366	0.000775	0.000019228	0.03237595	30.88712478
US RLP^2	1	-0.000260	0.01203255	-0.022	0.9829	0.000074248	0.000000206	0.19608934	5.09971638
Japan RLP_2	1	0.020905	0.02929474	0.714	0.4814	0.000674	0.000226	0.01854851	53.91267746
Japan RLP^2	1	0.017962	0.02286365	0.786	0.4387	0.009381	0.000274	0.01743937	57.34151205
Japan RLP^3	1	-0.017325	0.00932246	-1.858	0.0737	0.003415	0.001532	0.01812661	55.16752663
Japan $DOMTRAN_2$	1	0.022466	0.01818259	1.236	0.2269	0.000577	0.000677	0.04740530	21.09468768
Japan $DOMTRAN_2^2$	1	-0.005738	0.01933147	-0.297	0.7688	0.000146	0.000039093	0.08787702	11.37953880
Japan $DOMTRAN^3$	1	-0.008145	0.01616597	-0.380	0.7067	0.000064111	0.000064111	0.02615847	38.23145490

RHO OF .110333 INSERTED IN FORMULA

Test of First and Second Moment Specification

DF: 36 Chisq Value: 32.0749 Prob>Chisq: 0.6558

Durbin-Watson D	1.899
(For Number of Obs.)	37
1st Order Autocorrelation	0.049

Printout to Supplement Table 9

NOTE: No intercept in model. R-square is redefined.
Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	0.68860	0.06260	115.983	0.0001
Error	105	0.05667	0.00054		
U Total	116	0.74527			

Root MSE	0.02323	R-square	0.9240
Dep Mean	0.07103	Adj R-sq	0.9160
C.V.	32.70598		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Dummy Britain	1	0.087602	0.00418393	20.938	0.0001	0.344576	0.236610	0.79057259	1.26490598
Dummy France	1	0.066254	0.00414683	15.977	0.0001	0.188704	0.137774	0.78466498	1.27442926
Dummy Japan	1	0.044869	0.00426938	10.510	0.0001	0.090175	0.059613	0.80028431	1.24955592
US RECSIZE$_2$	1	-0.039050	0.00791411	-4.934	0.0001	0.023657	0.013140	0.49336328	2.02690407
US RECSIZE^2	1	-0.007068	0.00611577	-1.156	0.2504	0.006024	0.000721	0.62812284	1.59204528
Pooled RECSIZE$_2$	1	-0.030678	0.00780084	-3.933	0.0002	0.016176	0.008348	0.35330778	2.83039339
Pooled RECSIZE^3	1	-0.002103	0.00316357	-0.665	0.5077	0.000581	0.000238	0.50756362	1.97019638
Pooled RECSIZE^3	1	0.002085	0.00193311	1.079	0.2832	0.000010352	0.000628	0.25586849	3.90825770
Pooled INFPOW$_2$	1	0.041403	0.00904673	4.577	0.0001	0.003071	0.011304	0.35573768	2.81106011
Pooled INFPOW^2	1	0.021900	0.00559954	3.911	0.0002	0.000041096	0.008256	0.31893644	3.13542092
Pooled INFPOW^3	1	-0.015000	0.00279172	-5.373	0.0001	0.015581	0.015581	0.25327862	3.94822110

RHO OF .750459 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 62 Chisq Value: 63.1368 Prob>Chisq: 0.4359

Durbin-Watson D	1.839
(For Number of Obs.)	116
1st Order Autocorrelation	-0.005

Printout to Supplement Table 10

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	0.02573	0.00429	6.091	0.0002
Error	32	0.02253	0.00070		
C Total	38	0.04826			

Root MSE	0.02653	R-square	0.5332
Dep Mean	0.16459	Adj R-sq	0.4456
C.V.	16.12142		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.143749	0.00742870	19.351	0.0001	1.056470	0.263624	.	0.00000000
US RECSIZE	1	0.014354	0.01568293	0.915	0.3669	0.007373	0.000590	0.37651137	2.65596226
US RECSIZE^2	1	0.039950	0.01243583	3.212	0.0030	0.000848	0.007266	0.66775945	1.49754527
Britain RECSIZE	1	-0.055994	0.01458709	-3.839	0.0005	0.016610	0.010374	0.35799351	2.79334676
Britain RECSIZE^2	1	0.003920	0.01009354	0.388	0.7003	0.000149	0.000106	0.76225153	1.31190291
Britain INFPOW	1	0.000227	0.01147419	0.020	0.9844	0.000232	0.000000275	0.41971140	2.38258953
Britain INFPOW^2	1	0.004559	0.00530162	0.860	0.3962	0.000521	0.000521	0.70503730	1.41836467

RHO OF .560462 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 27 Chisq Value: 31.5661 Prob>Chisq: 0.2485

Durbin-Watson D	1.827
(For Number of Obs.)	39
1st Order Autocorrelation	0.003

Printout to Supplement Table 11

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	0.08148	0.01358	32.282	0.0001
Error	33	0.01388	0.00042		
C Total	39	0.09536			

Root MSE	0.02051	R-square	0.8544
Dep Mean	0.14532	Adj R-sq	0.8280
C.V.	14.11436		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.144551	0.00760427	19.009	0.0001	0.844662	0.152010	.	0.00000000
US RECSIZE	1	-0.035164	0.01411603	-2.491	0.0179	0.061108	0.002810	0.13210670	7.56963857
US RECSIZE^2	1	-0.002121	0.00786796	-0.270	0.7892	0.000009468	0.000030559	0.63186039	1.58262809
France RECSIZE	1	-0.016206	0.00768507	-2.109	0.0426	0.012905	0.001871	0.36461133	2.74264653
France RECSIZE^2	1	0.003146	0.00267020	1.178	0.2471	0.001671	0.000584	0.78054199	1.28116106
France INFPOW	1	0.047997	0.01569452	3.058	0.0044	0.005786	0.003934	0.13376431	7.47583588
France INFPOW^2	1	-0.000657	0.01249364	-0.053	0.9584	0.000001164	0.000001164	0.40859043	2.44743861

RHO OF .475057 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 27 Chisq Value: 31.6501 Prob>Chisq: 0.2453

Durbin-Watson D	1.953
(For Number of Obs.)	40
1st Order Autocorrelation	0.008

Printout to Supplement Table 12

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	0.01978	0.00247	13.121	0.0001
Error	28	0.00528	0.00019		
C Total	36	0.02506			

Root MSE	0.01373	R-square	0.7894
Dep Mean	0.16142	Adj R-sq	0.7293
C.V.	8.50423		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.163939	0.00718386	22.820	0.0001	0.964100	0.098139	.	0.00000000
US RECSIZE$_2$	1	0.001203	0.01635325	0.074	0.9419	0.001001	0.000001020	0.03455818	28.93838662
US RECSIZE^2	1	0.017525	0.00931742	1.881	0.0704	0.000005329	0.000667	0.16747759	5.97094825
Japan RECSIZE$_2$	1	-0.037034	0.01898358	-1.951	0.0611	0.001146	0.000717	0.02231677	44.80934786
Japan RECSIZE^2	1	-0.030456	0.01315486	-2.315	0.0281	0.007315	0.001010	0.05052937	19.79046850
Japan RECSIZE^3	1	0.001839	0.00659065	0.279	0.7823	0.002389	0.000014665	0.03969702	25.19081074
Japan INFPOW$_2$	1	0.071287	0.01589264	4.486	0.0001	0.006007	0.003792	0.03028831	33.01604137
Japan INFPOW^2	1	0.021379	0.01122952	1.904	0.0673	0.000030300	0.000683	0.06594690	15.16371418
Japan INFPOW^3	1	-0.018609	0.00588057	-3.164	0.0037	0.001887	0.001887	0.04738838	21.10221787

RHO OF .190192 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 35 Chisq Value: 36.5960 Prob>Chisq: 0.3946

Durbin-Watson D	1.870
(For Number of Obs.)	37
1st Order Autocorrelation	0.045

Printout to Supplement Table 13

NOTE: No intercept in model. R-square is redefined.
Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	11	0.77049	0.07004	99.544	0.0001
Error	105	0.07388	0.00070		
U Total	116	0.84437			

Root MSE	0.02653	R-square	0.9125
Dep Mean	0.07641	Adj R-sq	0.9033
C.V.	34.71506		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Dummy Britain	1	0.099323	0.00487075	20.392	0.0001	0.397971	0.292593	0.76050579	1.31491439
Dummy France	1	0.077177	0.00486357	15.868	0.0001	0.218700	0.177183	0.74368445	1.34465633
Dummy Japan	1	0.054085	0.00509481	10.616	0.0001	0.104510	0.079297	0.73265806	1.36489320
US RECSIZE	1	-0.036204	0.01174150	-3.083	0.0026	0.024862	0.006690	0.28021812	3.56864855
US RECSIZE^2	1	-0.008337	0.00811989	-1.027	0.3069	0.005438	0.000742	0.44138784	2.26558121
Pooled RECSIZE$_2$	1	-0.027820	0.00882044	-3.154	0.0021	0.015935	0.007000	0.35150628	2.84489940
Pooled RECSIZE$_2^2$	1	0.002697	0.00354653	0.761	0.4486	0.000594	0.000407	0.52563153	1.90247339
Pooled RECSIZE$_2^3$	1	0.000193	0.00223661	0.086	0.9313	3.4479419E-8	0.000005262	0.25106591	3.98301788
Pooled DOMTRAN$_2$	1	0.028475	0.01736096	1.640	0.1040	0.001508	0.001893	0.14492596	6.90007519
Pooled DOMTRAN$_2^2$	1	-0.006181	0.00770543	-0.802	0.4243	0.000614	0.000453	0.46801679	2.13667550
Pooled DOMTRAN$_2^3$	1	-0.004984	0.00697366	-0.715	0.4764	0.000359	0.000359	0.17175510	5.82224335

RHO OF .731563 INSERTED IN FORMULA

Test of First and Second Moment Specification
DF: 62 Chisq Value: 40.3682 Prob>Chisq: 0.9849

Durbin-Watson D	1.854
(For Number of Obs.)	116
1st Order Autocorrelation	-0.007

Printout to Supplement Table 14

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	0.05295	0.00883	15.544	0.0001
Error	32	0.01817	0.00057		
C Total	38	0.07112			

Root MSE	0.02383	R-square	0.7445
Dep Mean	0.24766	Adj R-sq	0.6966
C.V.	9.62097		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.201877	0.00835756	24.155	0.0001	2.392176	0.331271	.	0.00000000
US RECSIZE	1	-0.009550	0.01830965	-0.522	0.6055	0.019002	0.000154	0.10497932	9.52568520
US RECSIZE^2	1	0.035426	0.00946706	3.742	0.0007	0.006543	0.007950	0.56677389	1.76437203
Britain RECSIZE	1	-0.051380	0.01173648	-4.378	0.0001	0.020616	0.010881	0.23742700	4.21182086
Britain RECSIZE^2	1	0.006830	0.00866674	0.788	0.4364	0.000960	0.000353	0.71171210	1.40506252
Britain DOMTRAN	1	-0.019140	0.02114003	-0.905	0.3720	0.002510	0.000465	0.07615547	13.13103276
Britain DOMTRAN^2	1	0.028778	0.01190129	2.418	0.0215	0.003319	0.003319	0.27332898	3.65859492

RHO OF .336858 INSERTED IN FORMULA

Test of First and Second Moment Specification

DF: 27 Chisq Value: 24.5997 Prob>Chisq: 0.5969

Durbin-Watson D	1.829
(For Number of Obs.)	39
1st Order Autocorrelation	0.026

Printout to Supplement Table 15

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	6	0.04682	0.00780	16.906	0.0001
Error	33	0.01523	0.00046		
C Total	39	0.06205			

Root MSE	0.02148	R-square	0.7545
Dep Mean	0.04497	Adj R-sq	0.7099
C.V.	47.76984		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.045861	0.00410568	11.170	0.0001	0.080902	0.057587	.	0.00000000
US RECSIZE	1	-0.056437	0.01701771	-3.316	0.0022	0.031149	0.005076	0.15533624	6.43764782
US RECSIZE^2	1	-0.001942	0.01091469	-0.178	0.8599	0.004033	0.000014612	0.57013569	1.75396843
France RECSIZE	1	-0.031547	0.00771590	-4.089	0.0003	0.009717	0.007715	0.46938828	2.13043250
France RECSIZE^2	1	0.003963	0.00253137	1.566	0.1270	0.001137	0.001131	0.80519838	1.24192997
France DOMTRAN	1	0.018821	0.01632761	1.153	0.2573	0.000574	0.000613	0.20590123	4.85669764
France DOMTRAN^2	1	-0.007589	0.01132004	-0.670	0.5072	0.000207	0.000207	0.44088174	2.26818194

RHO OF .835677 INSERTED IN FORMULA

Test of First and Second Moment Specification

DF: 27 Chisq Value: 30.8490 Prob>Chisq: 0.2774

Durbin-Watson D	1.960
(For Number of Obs.)	40
1st Order Autocorrelation	0.005

Printout to Supplement Table 16

Dependent Variable: RRTRADE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	0.01455	0.00182	4.687	0.0010
Error	28	0.01087	0.00039		
C Total	36	0.02542			

Root MSE	0.01970	R-square	0.5725
Dep Mean	0.16391	Adj R-sq	0.4503
C.V.	12.01864		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|	Type I SS	Type II SS	Tolerance	Variance Inflation
Intercept	1	0.167857	0.01370513	12.248	0.0001	0.994073	0.058218	.	0.00000000
US RECSIZE$_2$	1	0.002246	0.02356119	0.095	0.9247	0.001055	0.000003527	0.03328375	30.04469592
US RECSIZE^2	1	0.012664	0.01341887	0.944	0.3534	0.000006840	0.000346	0.16238998	6.15801528
Japan RECSIZE$_2$	1	-0.002017	0.02392902	-0.084	0.9334	0.001167	0.000002758	0.02809588	35.59240338
Japan RECSIZE^2	1	-0.018527	0.01811735	-1.023	0.3152	0.007451	0.000406	0.05357488	18.66546279
Japan RECSIZE^3	1	-0.008246	0.00894251	-0.922	0.3644	0.002502	0.000330	0.04332715	23.08021686
Japan DOMTRAN$_2$	1	0.025751	0.01996244	1.290	0.2078	0.002330	0.000646	0.04010219	24.93629439
Japan DOMTRAN^2	1	0.004018	0.01866709	0.215	0.8311	0.000037199	0.000017978	0.09498510	10.52796706
Japan DOMTRAN^3	1	0.001026	0.01460332	0.070	0.9445	0.000001914	0.000001914	0.03259652	30.67812462

RHO OF .177742 INSERTED IN FORMULA

Test of First and Second Moment Specification

DF: 36 Chisq Value: 33.7555 Prob>Chisq: 0.5758

Durbin-Watson D	1.926
(For Number of Obs.)	37
1st Order Autocorrelation	0.031

VITAE

VITAE

Curtis Edwin Peet was born in Beaumont, Texas on December 1, 1956. He graduated from John Foster Dulles High School in Stafford, Texas in 1975. In 1979 he earned a Bachelors of Business Administration from Abilene Christian University in Abilene, Texas. From 1980 to 1982 he worked for Texas Instruments Corporation in Lubbock Texas. In 1982 Curtis began serving as a minister for the Churches of Christ and continued in this capacity until 1988. During this time he received a Master of Arts degree in Biblical Studies in 1984, and a Master of Divinity Degree in 1985, both from Abilene Christian University. In 1988 Curtis earned a Master of Arts degree in Political Science from Purdue University in Lafayette, Indiana. He immediately began the doctoral program there and was granted a Doctor of Philosophy degree in Political Science in August, 1993. Curtis currently lives in Lafayette, Indiana with his wife, Dr. Susan Hobbs Peet, and their three children, Andrew, James, and William.