

POWER, WEALTH, AND TECHNOLOGY:
Industrial Decline and American
National Security

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Introduction

The debate on American competitiveness will become a debate about national security.¹ The industrial development of Japan, the reconfiguration of European relations, and the decline of the American industrial position presses forward the old question of the relation between technology, wealth, and power. It does more than highlight the way nations can and do act to maximize their take from market exchange, act systematically to create more advantageous terms of trade. It compels us to treat as a security issue the political economy question of how national policy influences the location and control of wealth. For forty years, two generations, security analysis could live in a separate compartment and focus on critical but often arcane issues of weaponry. That will no longer be possible. Arguments about throw weights are being supplemented, indeed may be supplanted in emphasis, by arguments about industrial and technological development. Structural theorists will have to concern themselves with how national capabilities are generated; political economists with how and when wealth is converted to power. As a result, the balance between systems level and domestic explanations of international affairs must be reconsidered.

That national security rests on economic foundations, on the ability to generate and focus resources, is not a new discovery. But because America's capacity, relative to our allies and rivals, to generate and control economic resources has been radically reduced in the last fifteen years, the links between power, wealth, and technology requires our attention anew. From a position of dominance we have begun to risk dependence in arenas from finance through some segments of technology. As a consequence, the security analysis of the last forty years must be reformulated to locate and identify national interests and develop strategies for

pursuing them. Policy in the last decades rested on several foundations, each of which has changed profoundly: the Soviet Union as our central rival posing an enduring military challenge, a threat now altered in perception and reality; American provision of military security to Allies in Asia and Western Europe, which in the first decades after WWII was an economic and technological necessity but now has become a political choice; and American economic and industrial pre-eminence, which has passed leaving only the debate about the depth of erosion.

This essay approaches the problem from the vantage of the third change, the shift in our economic and technological position. It proceeds in four steps. The first assesses the changed American position in the global economy. It proposes that America's decline relative to its allies is fundamental; it is not simply an extension of post-war reconstruction but of a basic loss of industrial position. It suggests that an assessment of a nation's industrial and technological power that can be focused on international objectives must rest on more than aggregate growth or trade figures. It must rather examine the fabric of the industrial system, the composition and development of the production base.

The second step assesses the changing ties between military and commercial technology. It proposes that those changes make competition in commercial products directly important to security technologies precisely at the moment when America's industrial position in commercial technology is weakening. Our military technology will not protect our commercial position. Rather our weakening position in commercial technology, particularly consumer durables, threatens our military position. This is not simply a policy issue. The character at any moment of the links between power, wealth and technology rests on specific elements of the linkages between civilian and military product.

The third section contends that three separable, but interconnected, regions have emerged. The central proposition is that a multi-polar economic system will produce a multi-polar security system because each of these separable regions has the political capacity and techno/industrial foundations for independent action. The security as well as trade implications of domestic programs for industrial and technological development must be examined. Do nations or regions use these policies as means of internal balancing in the international arena as well as mechanisms to augment wealth?

Fourth, the implication of the analysis is that our intellectual agendas must shift as the substantive problems around us change. The American case becomes then an example of a general problem; its analysis suggests both the limits to structural theories which do not ask how the distribution of capabilities changes and the failure of political economy to confront the conversion of wealth into power in the advanced industrial democracies. Domestic structures in political economy seek to explain economic policy but do not consider how economic policy and industrial technological development bears on security.

The Emergence of Vulnerability: America's Deteriorating Position in the Global Economy²

America is not being transformed from unchallengeable giant into feeble pygmy. Its economy remains the world's largest and, despite Japanese advances, its technological and scientific capacities the deepest and broadest. And, in any case, its capacities were more limited than the power it was perceived to have, creating as Sam Huntington has remarked a "Lippman Gap" between extensive commitments and limited resources. For years the American economy has grown more slowly than those of many of its major trade partners.³ America's extraordinary share of global production and trade has steadily receded. Much of that is to be expected. As

production capacity was restored our share of production and trade dropped. At the same time the fast growth countries—Japan, Germany, and France are examples—both borrowed best industrial practice from the United States and were rapidly shifting resources out of agriculture into industry. Somewhat complacently we reassured ourselves that the fundamental American position had not changed; rather a more traditional balance among the industrial powers was being restored. But in any case our position of technological leadership seemed secure. However, the differential in growth rates continued. Indeed, the absolute level of industrial investment in the United States has now fallen behind Japan. And our technological leadership is now severely challenged. The changes in the last decade are profound. America has become vulnerable, critically exposed, to decisions and choices made abroad. It seems in a generation we have gone from a position of dominance and hegemony through a phase of interdependence to the beginnings of vulnerability. This section develops two positions. First, the American decline is not simply a continuation of reconstruction and catch-up by our allies, but a new and deeply rooted process. Second, the deterioration cannot be assessed from aggregate growth or trade figures alone, but can only be seen in the evolution of industrial technology and competition.

The point of departure for the recent American slide is not that of post war dominance. The proposition here is that a second, and more serious slide began in the mid 1970s when American hegemony had already passed. Two processes have been at work, one macro and one industrial. First, mistakes in macro economic policy have moved the United States quite suddenly from its position as the world's largest creditor to that of the world's largest debtor.⁴ That position will not be easily reversed. Neither Europe nor Japan is ready to volunteer to absorb the massive excess of imports over debts for an extended period. Nor will the more modest goal

of eliminating the trade deficit that continuously adds to the debt be so simply accomplished either. A century ago when we were last a debtor, the borrowings were invested in national development. Now they are consumed. The debt in any case changes America's international position. It is not just that the outflow to service the debt eventually force domestic belt tightening. The United States is at once more vulnerable to and constrained by decisions made abroad, less able to exert its influence on behalf of foreign policy objectives.⁵ If, as many would suggest, economic influence is of increasing importance and military power of diminished utility in shaping international events, the American account or arsenal—choose your own metaphor—is depleted.

Second, and central to our story here, there are significant changes in America's industrial position. The emergence of the deficit doesn't contain many mysteries. The huge domestic deficits financed by foreign funds drove up the dollar's value and priced many American goods out of domestic and international markets in the early 1980s. The puzzle lies, rather, in the failure of the deficit to be eliminated by the sharp drop in the value of the dollar in the late 1980s. The price elasticity of imports changed. Each unit change in the value of the dollar produced a larger increment in imports than it had a decade before.⁶ The result is that exchange rates did not operate as expected. The American propensity to import has risen radically because we no longer are competitive in several crucial consumer durable sectors.⁷ Because American producers were driven out of markets altogether or found their competitive position weakened, decline in the value of the dollar didn't staunch our import hunger.⁸ Underneath the enormous deficit and the macro-economic processes that contributed to it, lies an American production problem.

The Japanese faced a similar problem a few years later, trying to cope with a rising currency. In the late 1980s the yen rose in value sharply, leading even comic

book economic texts to predict factory closures and economic disaster.⁹ But disaster didn't come. A trade deficit didn't emerge. The Japanese trade surplus stabilized at a very high level. Certainly, macro-economic conditions in Japan at the time the yen rose were different than they had been in the United States when the dollar mounted, and this facilitated Japanese adjustment.¹⁰ Certainly the Japanese firms pursuing strategic leverage in which dominant position could be translated into profit adopted the pricing policies needed to go with that strategic approach. They simply refused to exit crucial markets. Certainly the difficult to access Japanese market slowed, though did not fully block, imports.¹¹ Critically, though, an important part of the adjustment came because Japanese firms used manufacturing innovation and advantage to defend their market positions. They had a decisive weapon that had not been available to American firms earlier in the decade.

The American position in global manufacturing competition changed abruptly.¹² After World War II the United States made things others could not produce; and products others could make American firms often made better and cheaper. The dominant position rested on a system of mass production and divisionalized management that emerged in the late 19th and early 20th century. These real innovations in the organization of production and corporate control were responses to the particular circumstances in American economic development.¹³ Other countries tried to catch up. They sought to imitate what we did; they saved and invested to do so. But they never did really imitate the United States. Rather, the most successful innovated themselves and built the basis for advantage in global markets.

Two aspects of post-war development in the advanced countries outside the United States concern us: policy and production. Our two most successful competitors Japan and Germany chose to emphasize investment in production over

consumption, creating macro conditions for rapid growth. After WWII we in the United States tended to view deviations from our form of capitalism as either partial modernization or apostasy. We were very slow to recognize that there was more than one form of capitalist market economy. Those differences in policy and institutional structure create distinct patterns of market logic and created certain types of firm strategies. The differences, as we have learned, assisted industrial and technological development. Those corporate strategies in turn generated significant innovations in production and product development. Real innovations in production and in technology development were generated and entrenched.

The second set of innovations lies in production and production organization in countries as diverse as Japan, Germany, and Italy. The hypothesis here is that these breakthroughs are of sufficient scope and power to alter the relative position of nations. Elements of those breakthroughs are found in the United States, but the evidence is that the new approach is not as well established or as diffused in this country as it is elsewhere. What is emerging is not incremental or even radical improvement in an old system, but a new approach. For this essay we must establish that these developments represent a sharp and radical break with past practice, a break that establishes a more rapid development road or a distinct technological trajectory.

The central codeword of the new manufacturing is flexibility, a term so widely and variably used it has indeed tended to become a slogan rather than a concept. But there is meaning. The new flexibility in manufacturing has two important components that can be analytically separated. One is static flexibility, the capacity to vary product mix on a single production line or to automate batch production. The second is dynamic flexibility, the capacity to introduce new production methods and products. These two analytic components of flexibility, or capacities to be

flexible, have been combined in two forms. One is flexible automation, the ability to introduce variety and rapid change into volume production. The popular notions of quality circles or just in time delivery are in fact simply elements of a new approach. Until recently volume production has been dominated by the rigidities of scale economies, expensive equipment dedicated to specific tasks in which the costs could only be recouped by large production runs of the same item. Variety could be very costly, which is why moving to variety on a single line or automating batch production is so critical. Now organizational innovation reinforced by micro-electronics have introduced variety and rapid change in volume production.¹⁴

The other form is flexible specialization.¹⁵ Clearly evident in Northern Italy and parts of Germany, this model involves an attack by smaller firms on niche markets.¹⁶ It is built on craft skills and an infrastructure of communities that permits horizontal ties amongst firms that compete one day, collaborate the next. In either package—flexible automation or flexible specialization—flexibility affords enormous competitive advantage. It provides the capacity to respond rapidly to market or technology changes by bringing out new products or quickly introducing new production technologies.

The concepts of flexibility are evocative, and the observed forms of flexible specialization and flexible automation really suggest the emergence of a break from practices dominant in the middle part of this century. The evolution in manufacturing practice can be depicted from another vantage. In a truly remarkable work Ramchadran Jaikumar has depicted the development of the technology of process control.¹⁷ He argues manufacturing has evolved through six steps, each step involving changes in how people thought about manufacturing and creating the substantial advances in productivity and quality. Each step addressed a different source of variance in the production system and by mastering those sources of

variance gave a burst of competitive power to the newly innovated approach. The first three, I would argue, culminate in the post-WW II American system. Those first three steps are: 1) the original emergence of machine tools in England, 2) the establishment of the American system with special purpose tools and interchangeable parts, and 3) the Taylorist system of people management. Each of the first three steps saw an increase in scale, increasing specification of tasks before production began, and rigid unchanging control of the system once in operation. That rigidity limited response to the unexpected inside or outside the production system. The next two steps Jaikumar depicts are, I would suggest, entangled with the Japanese production innovations. Those next steps are the introduction of a dynamic adaptive world through statistical process control and the introduction of information processing and numerical control. The sixth step, on the horizon with no leader yet established, is the emergence of intelligent system and computer integrated manufacturing. These last three steps reverse the trend toward scale and of tightly managed control of people in the production process. The system built in these last three steps is adaptive with extraordinary levels of productivity and quality. Jaikumar's analysis and historical research suggests radical productivity jumps with the introduction of each step. Fully developed the most advanced systems imply an order of magnitude increase in productivity and even more astounding improvement in quality, using product rework as a measure of quality. Now, effectively, best practice—the most advanced systems in use—is moving through the fifth phase with the sixth phase clearly imaginable but perhaps somewhat beyond current technical and organizational capacity. Radical discontinuous jumps in production technology create distinct competitive advantage for firms and nations.

Answering the question, why did these production innovations occur with such force in Europe and Japan and not in the United States, helps suggest how difficult a competitive American response will be. An initial answer is simple and obvious. A dominant and effective system existed in the United States. Until that system was challenged, there would be little need or incentive to alter existing practice. Why though did it emerge elsewhere? Indeed if we are to believe some of the analyses, the flexible approach already existed, but was simply masked by the dominant approaches of an era of mass production.¹⁸ The view here is that these innovations were largely the creation of the dynamic of post-war markets. Take the Japanese case. After the war Japan's market was protected and growing rapidly. Its firms were technology followers borrowing technology abroad. For companies, that meant that firms faced the need to borrow and implement rapidly technology from abroad. Each market increment that came through growth allowed the possibility of borrowing and implementing another round of imported technology. In essence in quite traditional industries, Japanese firms faced conditions Americans associate with high technology industries, rapid growth and technological development forcing dynamic adaptation. Learning curve economies dominated, making the pursuit of market share a necessity to sustain short term profits. In that environment and with capital short, a system emerged of semi-market ties between assemblers and component producers that organized production in new ways. Organizational innovations, including the use of statistical process control, moved firms into the fourth of Jaikumar's stages and laid the foundation for the effective introduction of NC machine tools in the next phase. Distinct institutional settings generated distinct responses to market pressures.

The problem for America lies not in the innovations abroad, innovations which are advancing production and product development to our advantage as well

as that of our competitors. Rather the difficulty is that the response to the new international pressures has been driven by misconceptions. The mythologies, very difficult to shake off, have affected both government and firms. In the policy arena our labels and techniques for counting have misled us about the character of economic change. The notion of sunrise and sunset industries distorted our understanding both of trade and the economy. We were slow to grasp that the bulk of the sunrise industries produce intermediary goods used in the products and production of other industries. Consequently, the so called sunset industries were the clients of the so called sunrise industries. The problem was how to use the new transformative technologies to alter traditional industries. Similarly, the notion of a post-industrial society kept us from understanding that we were witnessing a transformation in industrial production, a shift in the role of services in manufacturing, not a move up and out of industry. A substantial portion of service activity is so tightly linked to manufacturing as to be inextricably associated with it, that is if you lose the manufacturing then you lose the service activity.¹⁹ Our labels and techniques for counting mislead us.

Similarly there were a set of corporate myths.²⁰ The first was the notion that one could win with technology, leaving the dirty business of production to others. Certainly, this led firms to cede parts of the market where production mattered most to foreign companies that then built distribution channels and product expertise from which to attack the technology intensive segments of the business. Equally, it deceived firms about the nature of product innovation. Product and process knowledge are not that separable, and except for a few disjunctures, new products are built from knowledge accumulated in early generations. Cede production and you limit product innovation. A second myth was the notion that the Asian advantage lay with cheap labor. That hid from view the powerful evolutionary steps

in manufacturing. American firms moved offshore transferring technology into Asian networks of production. A third myth was the notion that capital costs alone kept American firms from an effective use of technology, when—as the General Motors case reveals clearly—the central obstacle was an understanding of what to do. Finally, American firms believed they were engaged in strategic planning and disciplined control through a whole range of refined techniques for financial management. A manager did not really need to understand the problems or technologies of the industry or sub-sector, but rather with a set of universal tools could manage any problem. But look carefully at the tools. They involve a set of frames for thinking that act as blinders, that truncate if they do not eliminate strategic planning. For the most part the question of how to gain leverage to establish dominant market positions that would allow premium returns could not, within the methodology be asked. Rather marginal decisions, whether to adopt this piece or that piece of equipment for example, were made. The decisions involved asking how a new technology would work in an old system, not how an entirely new system would function.²¹

The decline in our position in international industrial competition will be difficult to reverse for several reasons. First, once displaced from markets during the period of the high dollar, American firms have found that in a wide range of sectors they no longer have product or cost advantages that permit them to recapture their lost position. But, second, it is not simple market position in specific sectors that has been lost. Rather we have lost in some sectors and are losing in others the capacity—in the form of skills, production equipment, and component manufacturers—to sustain competitive production and production development. In a wide range of sectors the United States no longer produces the underlying production equipment with which products are made. In numerically and computer

controlled machine tools our firms have been squeezed. Commercial robot producers are weakening. In textiles and apparel the most advanced machinery is coming from Europe and Japan. In semiconductors American producers continue to hold market position in logic devices and microprocessors, but the production equipment industry is slowly losing position to Japanese suppliers. Some critical pieces of equipment are only available in Japan and the know-how for system integration is centered there.²² These equipment and component sectors embed and often generate the technological advances in production and product know-how. Suddenly the United States is in the position of importing production technology, watching the advances in production practice and technology evolve abroad. It is not so much that we have become importers of technology in sectors from steel to semiconductors but that we are in danger of losing our capacity to sustain technological advance.

Third, industries are linked and interconnected. The national economy is more than a giant input output-table. Remove consumer electronic producers and the path of technology development of the semiconductor industry is changed. Remove the semiconductor industry and the capacity of users to develop advanced equipment is slowed. The flow of knowledge and learning in one sector passes to others through social not simply market channels, and when learning passes through market channels the flow is often between established networks of suppliers and users. Despite global interconnections among firms and world markets in many products, there are national technological trajectories.²³ The composition of the industrial base, the nature of firms, the character of the interconnections among those firms, the nature of the links to the international market all contribute to the technological opportunities that are perceived and pursued. The American civilian technological trajectory no longer suggests sustained or broad based leadership, and

indeed risks a continued erosion of its position. Nor, however, will the military technology base or trajectory provide an alternative.

From Spin Off to Spin On Technology

American military technology will certainly not rescue our commercial position. Rather, our weakening commercial position will almost certainly affect our capacity to develop military technology and systems. At an extreme it will affect our military position. Commercial technology, always the foundation of military technology, is of increasingly direct importance to security because the links between military and commercial technology are changing. Consequently, the meaning of national military capabilities must be reassessed and redefined. The links depend on the details of technology and international competition at a particular moment; there are not general theoretical answers that can provide a shortcut for those interested less in the dynamics of technology development than in its consequences for international power.

The relations between the civilian and military industrial sectors alter over time. The movement is not a progression, but perhaps a pendulum. The early development of mass production and interchangeable parts was accelerated in the United States by the military demand for rifles in the Civil War. Then, in the two world wars, the basic process innovations of mass production underlay America's ability to churn out the large numbers of tanks, guns, and planes. The defense production base was or grew directly from the commercial base. There were, though, precursors of a new model, including radar and artificial rubber as well as the dramatics of the atomic bomb and the rocket.

The model in the years after Second World War suggested that pouring in investments in science at the front end of the development pipelines would produce

technology at the other end. It implied that investments in big science and advanced technology would have their first applications in the military sector and diffuse to the civilian sector. Only the military, it was believed, could support the enormous development costs of the new technologies. It could pay those costs, indeed needed to do so, because American strategy in Europe hinged on a technology not a numbers advantage. The military had a major stake in, and invested heavily to support, the rapid development of jet aircraft, semiconductors, and computers. Its role in the rapid commercial emergence of these new industries was as confused and varied as it was important. In the case of the semiconductor industry, for example, it was not government R & D expenditures that accelerated the development of the industry. Those R and D investments were often misplaced. Rather the military played a role as first user; the products it demanded assured an early launch market. Loan guarantees made to bring production facilities on line quickly served to diffuse the technology widely among competitors, creating advantage and competition in the style of MITI two decades later.²⁴

For years the military helped justify expenditures on the ground that investment in advanced technologies first applied in military or aerospace uses would "spin-off" into commercial applications. This is still true; there are technologies and products initially developed for the military that have civilian product implications. Indeed as consumer durables such as automobiles begin to use more electronics, they require systems parallel to or simplified from existing advanced aeronautics.

Nonetheless, a new phenomena is at work. From Japan we find the importance of "spin-on" technologies.²⁵ Spin on technologies become established in the commercial sector. They are directly or with minor modification the basis of more sophisticated products or advanced military systems. The model of military

pre-eminence in the development of advanced technology is no longer accurate. The relationships will be much more interactive and balanced. The cutting edge of advanced technology is now increasingly driven by consumer products that incorporate advanced components and subsystems. As a result, Defense Department initiatives may no longer prove effective means of spurring either technology or commercial position.²⁶

Conversely, commercial success will likely be part of the basis of next generation military product. The most dramatic recent change is that two consumer durable industries, automobiles and consumer electronics, will be critical to the future of product and process development in the component industry. The components they use will be as sophisticated as those in military applications. Automobiles increasingly have electronics controls and systems previously found only in military applications. As a result, electronics will become an increasing portion of the value and cost of the car. Semi-conductor chips operating in "real time" to control the engine, braking system, and suspension in environments often as hostile as the battlefield already are found in sophisticated models and will soon become standard in most cars.²⁷ In consumer electronics the advanced micro-electronic circuitry of a digital television set will be of the same sophistication as advanced computers and the display systems for television push the technology frontier of the most sophisticated computers for business and scientific uses.²⁸ Not only are the components of great sophistication, but they must be of extremely high reliability. Constant repair and maintenance is not feasible in commercial settings, indeed in consumer electronics warranties often result in simple exchange rather than repair of products. Military and commercial product therefore begin to converge. Where they diverge is that consumer goods cannot tolerate high component and development costs.

Let us review the processes which are at work. First, the basic technological requirements of new consumer products now approach or equal those needed for more sophisticated applications. The huge development costs of advanced new technologies previously associated with military projects can now be supported by the volume sales of consumer products that incorporate these advanced technologies. Second, for commercial consumer applications the unit cost of the underlying technology components has to be very low. Auto producers will pay an order of magnitude less for semiconductor component technologies than would those applying the same or similar products to military or scientific products.²⁹ Low costs cannot be achieved by reduced functionality since a real time processor for engine or brake control on an automobile is a very sophisticated element. Those costs can only be achieved by the economies of volume manufacturing. More importantly those economies can be achieved by the application of revolutionary production approaches that have had their real birth and effect in the consumer durable sectors. Suddenly very inexpensive but extremely sophisticated components and subsystems with military applications will become available.

Speed of product development and new component introduction, a third issue, is so critical that it should be separated out and highlighted. The commercial pace of application of advanced technology to product and system is accelerating. Market competition is forcing the pace of product development, new strategies and organizations are allowing firms to respond. Honda and Toyota now can take an automobile from design to showroom in less than three and one-half years, twice as fast as Mercedes. Speed to market has important implications for military systems development. With the increasing application of electronics and materials to automobiles, the development problems in consumer durables are similar to those of military development. The American military has recently been concerned that the

time for military systems development has become so long that the components used in the system are often two generations old. The component technologies are advanced as design begins but obsolete when production starts.

Indeed it is a plausible hypothesis that civilian developers can almost certainly move complex systems from design to battlefield faster than traditional military suppliers. They are better organized to do it. More importantly, the very notion of what is the fastest route to the most advanced but reliable military systems in the field may have to change. The quickest route may no longer be, if it ever was, to jump to the extreme limits of the technically feasible at the moment a system is conceived. Rather it may be iterative innovation of the sort the Japanese have now made popular. Product development done through an endless series of small innovations may not be heroic. It can nonetheless outpace product developments that attempt to jump dramatically from one frontier to the next. Consider a military producer of country A that passes through two complete development cycles producing two generations of product, each incorporating advanced but standard components. It does these two cycles in the time it takes a producer in country B to pass through a single dramatic cycle. There are of course real limits to this argument. Yet at the end, where a two cycle model of limited immediate technological reach is possible, it may generate lower costs, more advanced systems, and greater reliability.

The old American R & D model had two characteristics: a pipeline from investment in scientific research to product innovation and spin-offs from military to civilian. In isolation they might be workable, but there are strong competitors. The new relationship between military and commercial technology makes many of our R&D approaches inappropriate to global competition. In Japan certainly science and where possible technology are borrowed. Efforts are focused on both technology development and diffusion. Public efforts are centered on generic technology

development, advancing technology to the point that product development and competition is really possible, and on direct commercial pay-offs from R & D efforts by government as well as firms. Europe has effectively applied advanced technology in traditional sectors and established positions in large scale systems. It has a strong position in advanced systems such as high speed railroads, rebuilt a position in aerospace, and held onto market position in many consumer durable products. Moreover in sectors such as chemicals, European firms are world powers. Despite a visible weakness in micro-electronics, its long term technology position is very strong. America faces real obstacles adjusting its research and development effort to meet these two challenges.

Neither the financing or organization of the American R & D effort is well suited to this shift toward the critical importance of commercial—really consumer durable—technology to advancing technology and military systems nor to the pressure from differently structured research systems. Although the overall level of American R & D remains high, expenditure is oriented toward military, and increasingly immediate military needs. The government expenditures are increasingly oriented in two directions, basic science and military. The civilian effort is low, and the effort financed by companies, and presumably of more direct impact on commercial position, is very low by international standards.³⁰

These funding patterns have consequences at the level of the firm and the choices the firm must make. The national scientific and engineering resources are limited, at least at any moment. Government funding of military applications shunts people away from civilian projects by helping military projects outbid civilian ones for talent. The result is that the price of engineering talent is pushed up for the civilian sector, and adequate talent is often still not available. This both raises costs and brings firms to undertake some development efforts offshore. A different

problem is that small start up firms that initially develop advanced technology for military applications with Department of Defense money are often not permitted to develop the technology for commercial markets.³¹ All too often commercial products are developed outside the United States from the same generic technology as that which underlies American military systems.³² The result is that military spin-off may delay rather than facilitate commercial application and can delay—not accelerate—the mastery and development of the technology.

The organization of the public and particularly military R & D effort, not just its allocation among objectives, also poses serious problems. The bulk of the military funds are concentrated on a limited number of companies. Some such as Rockwell have been oriented toward the military markets. Others such as Ford have a separate military division that is usually isolated from the civilian operations. Combining corporate organizational barriers with government security concerns and controls creates a military R & D colony in the American economy. The Pentagon colonial market differs profoundly from the commercial world. It is not simply that project bidding procedures involve selection criteria that in fact amount to highly politicized speculation on future cost, performance and procurement or that costing procedures that involve cost plus contracting inherently limit incentives to invest in cost saving production technologies. Rather, the very process of control for abuse and corruption compels highly bureaucratic management approaches. That colony, the Pentagon marketplace, is dominated by a single buyer (or several if we count the services separately). Firms dependent on the military for research and production contracts adapt their organizational structures to the problem of marketing to the Pentagon.

More generally, dominant organizations that control a critical resource shape the structure of subordinate organizations that require that resource. The

subordinate organization adapts itself to obtain the critical resource. Those adaptations generally involve mimicking the structure of the dominant organization in order to provide better communication with those who make decisions.³³ The usual result is business strategies and organizational structures ill suited to the commercial world. Civilian and military initiative represent two different ways of developing advanced technology.

Technology's evolution follows trajectories that reflect the community and market context in which it develops. Those trajectories are not dictated by the technical knowledge. Technology is a "path dependent process" of learning in which opportunities for tomorrow grow out of research, development and production undertaken today.³⁴ The old line really matters; it depends on where you are coming from. Massive resources committed in specialized defense contractors to technology produced in batch processes for initial use in military projects will constitute one trajectory. Massive resources committed to commercial development produced in volume for consumer markets will constitute a separate trajectory.

The USAF supported the development of Numerically Controlled (NC) Machine Tool technology for application to advanced aircraft. The programming language proved too complex for general commercial applications. MITI supported the development of NC machine tools; in some versions forcing a single controller supplier to allow competition around commercial application and in other versions encouraging diffusion. In any case, commercial applications drove the Japanese industry. The resulting machine tools were lighter and simpler and vastly more successful in commercial markets than American products. Complex specialized NC tools for commercial uses developed in Germany from a tradition of high quality capital goods. In the end, the American producers who had focused on standard products were squeezed by the Japanese at one end and the Germans from the

other.³⁵ The difficulty is that these two trajectories, commercial and military exploitation of advanced science, may be competing routes, not complementary ones. Or differently, nations may be characterized by their technological trajectory, with some trajectories having more potential for growth and development than others.³⁶

For the United States the shift from spin-off to spin-on and the potential conflict between commercial and military trajectories pose policy problems. Are our approaches to military development obsolete for their own purposes? Are they counterproductive for the long run development of the national industrial base on which they must rest? In any case, it is not difficult to accept the most modest proposition with which this section began—military R & D is not going to get us out of the commercial trap, and cannot on its own assure the national technological development or perhaps military technology development.

Some Tentative Initial Implications

Some consequences of the American industrial decline position are obvious, others less so, and some quite debatable. The most significant question must be whether the emergence of a multipolar global economy will produce a multipolar security structure. Let us creep up on this most basic matter by suggesting some implications of the argument thus far.

The Economic Projection of Influence: American influence is doubly reduced if, as many argue, force is of reduced utility as a policy instrument in a nuclear world with regional politics shaped by mass mobilization. If so, economic influence is of increased significance. Then the basis for influence shifts from a domain, force, where we remain strong, to a domain of economics where our position is weakened. It has become a convention of discussion that over the last two generations the United States consistently used its economic resources for foreign policy purposes.³⁷ We are certainly less able to do so now. Rather than using

domestic policy as an instrument of foreign influence, our trade deficit and foreign debt begins to make us adapt our domestic policy to international constraints. The Super 301 rules of the new American trade law represent precisely such a reversal. Instead of using access to our market for foreign policy ends we begin to use security influence to force our allies to make changes that favor our companies. The practices, at least in the case of Japan, at which the policy is aimed have undoubtedly diminished over the years; but we react now because we are weaker and those foreign practices are thought to be directed at or endanger remaining centers of American strength.

Security and Military Equipment: A reduced industrial position, more particularly a declining industrial position, will directly influence the volume and quality of the military equipment we develop and procure. The production revolution will affect cost, quality, and development time of military as well as commercial products. The production cost gap between small batch production—the key to most advanced military equipment—and goods produced in volume will close as next generation production systems diffuse. Dollars, or yen, will go further. Development costs and time can be reduced if commercially developed components and systems were widely adapted for military product and systems. Product cycle time from conception to production is being radically reduced in commercial products, even complex high technology products. That increased speed allows complex systems to more effectively incorporate advanced components. Two cycles, instead of one long jump, involving smaller technological jumps may result in a flow of more advanced systems more reliable systems. Deployed systems will be built with component and subsystem technology that is both more proven and closer to the state of the art when introduced.³⁸ Since slightly less radical jumps are attempted in each cycle, the systems would tend to be more reliable. The logic is simple; an

advanced production and development system could at a reduced cost provide reliable weapons systems using state of the art componentry.

A consequence of our weakening industrial position will be diminishing allied dependence on American military technology and, conversely, increasing American dependence on foreign sources for critical products and technology. The debate about micro-electronics has focused attention on Japan. However, we may find ourselves equally dependent on the Europeans. For example, the new military telecommunications exchanges deployed since the famous Grenada phonebooth episode (when an officer was obliged to call over the public network) are French. The United States had stopped development of the equivalent projects.³⁹ The United States must confront the question of whether dependence on foreign, though allied, sources for crucial military technologies matters. We may decide that such dependence is acceptable, but we should not fool ourselves into believing this isn't a change or that it doesn't matter. Our control over vital technology has provided us a lever in discussions with allies, albeit when fully deployed the threat to deny technology has often been ineffective and counterproductive. There is no reason to believe that others will not use their levers to influence their discussions with us. The real question is how diminishing Allied dependence on American technology and emerging American dependence on foreign component technology—military interdependence if you wish—will affect interallied relationships. American domination of the state of the art in military systems is by no means assured.

Changing The Security Debate

This section contends that with these developments the western economy has become a multipolar one organized around three distinct regional groupings. This alters the American security problem and, arguably, the very structure of international politics as profoundly as the changes in Eastern Europe. When the

distribution of technological and industrial capacities is changed in the advanced world, the patterns of external dependence and self help change.⁴⁰ A basic change in a nation's capabilities to provide for itself shifts its rank in the international system. Sharply diverging rates of industrial growth or technology jumps that displaces established weapon systems can quickly change relative national positions.

National capability must be a dynamic notion. Enduring national power requires the capacity over the years to respond to external challenge by extending economic, technological, and military resources through internal and autonomously chosen actions. Indeed, the proposition is that the industrial and technological base for a full-fledged military capacity along with the political will for self help is, in this analysis, the key. Labels such as superpower must be avoided. Such terms embody in advance a definition of what power is and how it is obtained. So long as nuclear weapons make war among great powers improbable and critical regional crisis does not impinge, the potential to fully deploy a system may be sufficient to exert political will in global affairs and most crises.⁴¹ The potential—the capacity—reduces the payment a nation would be willing to make for security provided by others. In any case, dynamic capacity is a function of the internal political economy of the nation. What Ken Waltz calls internal balancing in the context of international politics blurs into what those concerned with the economy label positive industrial adjustment. Dynamic capability, internal balancing requires a look inside the nation-state, or in the case of Europe inside the political/economic region.⁴² Each of the three economic regions is capable of internal balancing, of acting politically to extend their economic and technological resources to respond to external challenge.

The argument in this section consists of three propositions: first, several distinct—and potentially separable—economic regions exist in the west. The notion of interdependence can mislead us about their interconnections. Second, each region

has the dynamic capabilities to engage in internal balancing in response to external threat. Third, indeed both Europe and Japan may already possess the capability to deploy a full strategic military system quickly if required by external threat or divergence on their part from American definition of threat. The immediate military threat from the Soviet Union is reduced in any case. In other words their present military potential is sufficient to make the industrial technological base the key meaning of national capability. This third proposition, let us acknowledge, is only suggested in this essay.

A Multi-Centered Global Economy

Now increasingly there are three coequal and distinct, though interconnected, regional economies in the West. The United States/Canada and Western Europe each represent about 25% of global GDP. In 1987 Japan represented 12.4% and Japan plus the NICS represented 15.8%. Moreover, the growth rate in Japan and the Asian region is substantially faster than in the United States or Europe, so the importance of this region, presently the smallest of the three, will expand. The United States/Canada is not likely to be the largest of these groupings by the year 2000.

These regions are not autonomous, but they are separable. The regions do trade extensively with each other, but despite corporate interconnections, extensive trade and direct foreign investment, national economic and technology bases endure. The primary external dependence of each region is on natural resource producers not on each other. American resource dependence is less than the others, but that does not alter the extent of regional separability. Economic interconnection does not obviate the central meaning of national power.

What are the indicators of separability? Foreign trade is a quite limited part of the GDP of each region. In the European case we must discount intra-European

trade—trade between France and Germany, just as we would discount trade between Ohio and California in the United States. Increasingly, even in export oriented Japan, domestic markets are the key to continued expansion. We should recall that until 1964 Japanese expansion was driven by domestic demand. Therefore, Japan is reverting to form, not following a new course.⁴³ Moreover, trade within the Asian region appears now to be growing more rapidly than trade outside the region. This has been true of Europe for twenty years. Thus, the rate of increase of intra-regional trade is greater than that of inter-regional trade in both Asia and Europe. External dependency for each region turns on raw materials more than on each others markets.

Second, each regional power is seeking and increasingly establishing an independent technological base, attempting to assure through domestic action the basis of national autonomy. The conviction is widespread in Japan that it will be the dominant technological power by the end of the century.⁴⁴ Indeed the view of some is that the transition has already happened.⁴⁵ European national governments, the European Community, and the individual companies are increasingly investing resources required to overcome European weaknesses and play to its technological strengths. There is a growing belief, almost a conviction, that Europeans can reestablish themselves as leading players. Each region—Europe, Japan, and the United State—seeks to establish—and in my view will succeed in establishing—an independent position in critical industries such as electronics and aircraft. The technological, as well as industrial basis, for regional autonomy is there.

The importance of the economic interconnections must not be exaggerated. Despite a rhetoric of interdependence, each region is surprisingly autonomous. Nations have long been vulnerable (that is unable to reverse their sensitivity) to developments outside their borders and to international market exchanges outside

their control.⁴⁶ Indeed critical vulnerabilities, those that threaten the stability of the political regime or of the economy, are not new either.⁴⁷ Historically the extent of interconnections, sensitivity, has grown, but so has the capacity of national governments to respond to the tasks that interconnections pose. The issue is the balance of political administrative "capacity" and the "tasks" posed by interconnections. It is too often assumed that because the interconnections have grown, and have grown in some dramatic arena, that national capacities have been outdistanced. The national government capacity to prevent these interdependencies from threatening the regime or economic stability has grown even faster. Compare for example the capacity to respond to external shock and stock market disruption among the advanced countries in the 1970s and 1980s with the economic and political dislocations of the 1930s.

National capacities to respond to and shape ties to the international system vary dramatically. Sovereign governments are central to the form and dynamic of economic interconnection. There are international financial markets whose stability certainly has come to require agreements among central bankers. But the international strategy of major national banks still turns on their national government policy and the character of national trade flows.⁴⁸ American firms may be vulnerable to foreign takeovers, but in Sweden and Germany as well as Japan hostile takeovers are extremely difficult. Technology may flow globally through multinational corporations, but government policies to develop technology internally have often been effective in controlling critical vulnerabilities and rebalancing national positions. When America was dominant everyone else was vulnerable to United States policy. That dependence was labeled interdependence. As American dominance, hegemony, receded, America became caught in the web of interconnections; it also became interdependent. The critical question then is not the

extent of interconnections but rather their structure, which countries hold the best position, and their form, the types of interconnections which can create political influence or critical vulnerability.⁴⁹ Labels such as asymmetric interdependence avoid the central fact that the structure of national capabilities remain central to their relationships.

National capacities to shape the nation's position in the global market vary not only with the size and power of the national economy in the system, but with the political and administrative capacities of national government. Let us note several dimensions. The ability to develop, select, and implement adjustment policies to external economic shock is the first dimension. Second would be limits and controls on direct foreign investment coming into the country. Not only Japan, but many European countries have extensive informal as well as formal means of controlling such investment. The range of instances is extensive. The recent SONY purchase of CBS took place in the same month that Europe acted to restrict foreign programming for television. Technically different to be sure, counter-instances with American investments in the privatizing television industry may be cited. But the intent and the basis to control foreign use of investment is clear. A third dimension is the extent to which that domestic process is shaped by foreign lobbying. The economic ties of trade, direct foreign investment, and financial flows are not in themselves ties that bind but are rather the foundation of political interests and influence. For example, can foreign investors influence the political process of the host country? Europe, both the Community and the critical countries, and Japan are almost certainly less open to influence by foreign economic interests than the United States. The extent that foreign economic position converts into political influence is not the same in each nation. Thus we need not just an economic table measuring interconnection, but a set of political "conversion" tables to evaluate the meaning of those tables.

Although the United States may—in the view of some—have begun responding to external challenge by expanding internal capabilities, it would still rank low in this chart. In any case, the first proposition—that separable distinct regions exist—is not challenged by evidence of interdependence. Or, more controversially Europe and Japan are acting to reinforce their capacity for separability while the U.S. welcomes the interconnection. At an extreme that implies American dependence and vulnerability.

European and Japanese Capacity for Internal Balancing

The second proposition is that both Europe and Japan have and are exerting the capacity for internal balancing, the existing resources and political capacity to expand its national or regional capabilities as a response to external threat. Japan with political capacity has created economic resources; Europeans with extensive underlying economic resources are creating the political capacity to exploit them. The suspect case is the United States. "Dynamic" national capabilities, internal balancing, requires the capacity to manage international market interconnections by domestic adjustment and the capacity to limit the conversion of foreign economic position into domestic political influence. Arguably the United States would go at the bottom of any comparative list. In any case the purpose here is to review well studied features of the Japanese and European political economy as evidence for the dynamic national capabilities for internal balancing. The exercise of such capabilities will convert the multi-polar economy into a multi-polar security system.

Japan:⁵⁰ Modern Japanese history is the story of the pursuit of development as a means to respond to external threat or as alternate to a classic foreign policy pursuit of power. The Meiji restoration, marking the beginning of modern Japan, was a response to the threat of foreign intervention. The creation of the modern state established the political will and instrument to generate an economic transformation;

the Japanese bureaucracy acting strategically created a market system and the conditions for rapid growth and industrial/technological development. Since WWII a strategy of economic development has been an alternative to a foreign policy seeking power in the global system. The government has done much more than simply assure a sound macro-economic foundation, but also played roles as gatekeeper and promoter.⁵¹ As gatekeeper the it sought to prevent foreign manufacturing firms from entrenching their position in the Japanese market. This forced the transfer and license of technology that could be developed by Japanese firms in a protected Japanese market. As promoter it sought directly to encourage the development of product and technology by these firms. The government sought consciously to force industry to restructure, to create advantage in global markets and to create comparative advantage in ever higher valued added and technologically advanced industries. The policy shaped the dynamics of a highly competitive market system. Aggressive strategies of investment for market share generated domestic excess capacity producing export surges on the one hand and the management of markets. That management of excess capacity has been labelled controlled competition.⁵² Corporate strategies to gain advantage from rapid expansion and technological borrowing resulted in a revolution in production. Japan shaped the terms of interdependence, the character of its links to the international economy, as a means of changing its place within the system.

The basic elements of a self-help development strategy are still in place. As Japanese firms have in some sectors become dominant in world market, the Japanese economy in recent years has opened and become more entangled in international markets. However the pattern of domestic closure, combined with intense internal competition to develop products and technologies developed in Japan or borrowed abroad, has continued. Japan remains a relatively impermeable market for foreign

producers.⁵³ It still tends not to import in sectors in which it exports, a pattern distinct from the rest of the advanced countries. In the last year imports of manufactured goods into Japan surged, albeit from very low levels and albeit that they have for now reached a plateau or a peak. The meaning of that surge is unclear. On the one hand it can be read to mean that Japan has finally started to import manufactured goods from foreign sources. On the other hand, if the imports are predominantly by Japanese firms from production locations abroad then the story is about the adaptation of Japanese producers and distributors to the high yen, not about the penetration of the Japanese market by foreign producers.

Which story is it? There are two pieces of evidence that can help us pick. One consists of anecdotes that are sufficiently diverse to suggest a pattern. For example, the Japanese government helped an inefficient aluminum industry relocate production outside of Japan. Plants were closed in Japan and a variety of mechanisms of subsidized financing used to permit firms to build specific capacity allocations at offshore sites. Imports from those plants were not subject to tariffs, were treated conceptually as if they were already inside the Japanese economy. Yet such imports would count as foreign goods in the trade statistics. One suspects similar attitudes broadly in the Japanese economy. The second piece of evidence comes from comparisons of the purchase of equipment by the subsidiaries of Japanese, European, and American firms in Australia are very revealing. European and American firms buy equipment widely on global markets. Japanese firms buy almost exclusively from Japanese suppliers, returning to Japan for equipment. They express a strong preference for working with Japanese companies and do not turn easily to global markets. The asymmetry of market access—whatever the mix of causes among policy, business practice, and client finickiness that underlie the relative impermeability of the Japanese market—is real and continues as a strategic

advantage. Foreign firms enter licensing arrangement they would not consider either in the American or European market.⁵⁴ Where once the government forced technology licensing by restricting direct foreign investment (and foreigners accepted it because they perceived Japan as weak), now financial muscle and market strength continue a flow of foreign technology toward Japan. The semipermeability or impermeability to the entry of foreign firms, the market asymmetry, permits firms to compete intensely among themselves in Japan honing product and process that then pour onto global markets. Equally important it makes other countries absorb in their markets the excess capacity that market share strategies generates. The Japanese firms are tempted to overbuild capacity and foreign firms to underbuild. The result, as in the case of semiconductor DRAM (Dynamic Random Access Memory) technology is that Japanese developments preclude or slow the commercial development of the technology by merchant semiconductor producers.

Moreover Japan is at the core of a region of vibrant and rapidly expanding countries. The strength of Asia as a production location does not rest only on the organization of the individual firms. Rather the advantage lies in two areas. First there are the networks of component and production companies that have appeared in the last decade. Once companies moved to Asia because the shopfloor workforce was cheaper. Now often they move because the shopfloor workforce is better trained and the engineering workforce is cheaper. Second, Japanese technology and components are at the core of the network. Korean televisions and cars for example depend on Japanese components. Thus a production core independent of American technology and know-how, though tied to American markets has emerged. As Asian incomes rise, an Asian market may emerge further disconnecting the Asian economies from the United States. Trade within the Asian complex has, by some

estimates, begun to grow faster than Asian trade with countries outside the region. The process of disconnection may already have begun.

In sum, Japan has throughout the postwar years acted to extend its industrial and technological foundation. It has continued to act to balance external weakness with internal action. Now the same capacity for extending internal capabilities builds on the world's most vibrant national and regional economy.

Europe:⁵⁵ An economic and strategic challenge has driven a set of middle powers to consolidate their markets and their influence. The movement to create in Europe a single market, and perhaps more, is itself driven not only by the emergence of Asia but by the real decline of the United States as a source of technology and production know-how. European elites are rethinking their roles and interests in the world, reconsidering their relations with the United States and within the European Communities. For the last two generations Europe's economic position has rested on a set of implicit bargains with the United States. Europe had access to American technology; even as it trailed in the development of advanced technology, it excelled at applying them.⁵⁶ Its position of privileged second might be grating but it was tolerable and did not provoke joint action. Suddenly crucial technologies often appear to be only available from Japan. In finance the dollar anchored the international financial system, which provided privileges to the United States, but stability and at least until 1971 the right for others to devalue against the dollar to maintain trade equilibrium. Now Tokyo and Bonn as much as Washington shape financial evolution. In trade, the American market was open while the United States accepted and encouraged the creation of the Community. Recent American trade legislation now threatens to close the market, or at least raises the possibility, while the Japanese market is relatively impermeable. The implicit economic bargains were built inside of explicit security bargains. Set aside arguments about culture or

history. America and Europe share a security problem, but Europe and Japan do not. Consequently relative dependence on Japan in finance and technology and the asymmetrical market access in trade make it unattractive to exchange America for Japan as hegemon.

European responses to this changed structure have been turned on leadership, perception, and timing. The European Community itself is an entrenched self interested advocate of further integration, so its role as leader in the 92 process is not surprising. The leadership of the European multinational corporations experienced most directly some of the consequences of the international economic changes. They have acted both politically, in support of Community and government initiatives, and in the market through mergers, takeovers, and joint ventures. The surprise is that the governments came to accept European level market oriented solutions. Traditional models of growth and the established national strategies they suggested failed, or at least were perceived as failing. The weakening of the left in some countries and a shift from the communist to market socialist left in others helped to make possible a debate about market solutions to Europe's dilemmas. An improbable coalition of like-minded elites emerged. Suddenly and unexpectedly Europe has begun to use regional domestic balancing to respond to the changed global structures.

As we have noted, Europe as a relatively self-contained economic unit already exists. For a generation Western Europe as a whole represented roughly one quarter of global gross national product, and the European Community over twenty percent. There are certainly two competing images of Europe. One image is of Europe as a set of small and medium sized countries that have opened themselves to the global economy and must adjust to it. The other image is of European nations, including those outside the Community but part of EFTA, moving over the last thirty years

from interlinked national economies to a regional economy. How far, or even along which precise road, the present movement will take Europe is unclear. Whether the economic bargains will be the basis of a broader common external policy, beginning security or military integration is not yet knowable. Yet there is now a substantial likelihood of an economic integration that involves both a single market and ever closer monetary and banking ties as well as common international economic positions. It now seems genuinely possible even likely that the European economic region will have significant political coherence and direction.

Europe's technology position is changing, and changing significantly. Europe's fundamental strengths have always been underestimated. They rest in an educated and highly skilled workforce, a sound foundation in science, and the enormous wealth built up through a long and successful industrialization. New strengths have been added to this older foundation. Those strengths lie in the application of advanced technology to traditional industries, a capacity at systems development and integration, and the use of political will to retain final product markets in the face of production or product advantage. Now the most obvious weaknesses of the postwar years are being confronted. For example the commitments in micro-electronics and telecommunications made by national governments, the Community, and the individual companies are beginning to succeed. Siemens and Philips are building a real capacity in dynamic Rams, and SGS/Thomson is emerging as a serious player in the global semiconductor market.

Europe is by no means a single political actor. It will remain a set of national, political communities and as a region will as a bargain amongst governments. Nonetheless, in a growing number of domains, it is able to act jointly to extend its capabilities. Japan certainly is able to do so. Therefore, each region represents both a technological/industrial entity capable of providing for itself in the international

system and the political will of maintaining that capacity. Yet neither is a strategic military power.

What Does Military Potential Count For?

Europe and Japan are regional economic powers that have the technological and industrial capacity for a strategic military machine in place, but that machine does not now exist. How politically significant is the capacity, the potential?

Japan has the component and subsystem expertise to put in place any military equipment it chooses. It already builds sophisticated tanks, and through a series of projects system expertise is being developed in aerospace. The FSX deal, we should not forget, was an American alternative to Japanese independent development of a fighter plane. Many Japanese believe that on its own Japan could have built a better plane.⁵⁷ Indeed, the increasing electronics content of weapons may provide the Japanese an opportunity to quickly establish an advanced weapons position by trading expertise in avionics for expertise in aeronautics.⁵⁸ Even now Japanese military electronics are more reliable, with longer times between service or failure.⁵⁹ The Japanese moreover are aware that they are likely to be able to produce systems less expensively than the United States. So, the Japanese military position is a matter of political choice not industrial or technological constraint.

Europe's situation is quite different. Europe can build varieties of systems of all types, too many varieties. Combined Europe is a formidable military player. There is some evidence—in planning, procurement, and industry structure—of increased European commitment to common defense structures. Amidst the conflicts and arguments, there is nonetheless movement. In any case, for now, each individual nation is dependent on the United States (or maybe now Japan) for important technologies. Europe's position is weaker in the underlying component technologies than in the systems it build.⁶⁰

In any case the United States is no longer the unique source of military know-how. Either alone, and more rapidly if they share technology, Europe and Japan can establish any form of military machine they might want. It is a political choice, turning on Japanese and European purposes. It is not a matter of relative technological or economic development. For Europe the issue is whether a common purpose can be defined or pursued. For Japan it is a matter of whether it will choose to assert a more extended military position. There are sets of circumstances that would lead to that choice. First, the dynamics of domestic politics could produce this result. A discussion has already begun of common defense policy, including joint procurement, as an element of the European construction. In Japan growing confidence and inter-party competition could change the place of defence in political debate. Nationalism, it should be noted, serves as conservative party tactic when confronted with challenges to economic or social privilege. The difficulties of the LDP may induce nationalist electoral tactics. Second, European or Japanese interests might diverge or be perceived to diverge substantially from those of the United States.⁶¹ The point though is not to speculatively construct a range of foreign policy scenarios. Rather there are real domestic and international circumstances that will lead Europe and Japan to construct the military machines they are now quite capable of.

How significant politically is the ready potential for an extended military position? The proposition here is that in the present context, it is a substantial political resource. Clearly in a direct military confrontation those with the weapons must be listened to. Yet short of a direct crisis, the military potential counts. It affects what Europe and Japan will pay for security. Equally important, military position is only one currency of international power. If the security situation continues to lose intensity, Europeans will insist on paying a lower economic price

for the security umbrella we provide, less willing to forgo the exercise of economic influence in the name of security interests. Our economic leverage has already eroded; our security leverage will have diminished.

A situation in which United States leadership of the security alliance continues because our allies can't define an alternative, or choose not to, is radically different from one in which our leadership is produced by our strength. In any case the rapid changes in Eastern Europe will almost certainly oblige a redefinition of the relations between the advanced industrial democracies, whether that redefinition comes within existing alliance institutions such as NATO and the EEC or not. It will almost certainly accelerate the shift in relationships suggested by this analysis. At an extreme, if American military expenditures are financed directly or indirectly by loans for our trade deficits, then the United States provides the mercenaries for an alliance system in exchange while accepting increased debt and the foreign control of assets it implies. That could be exacerbated if any dependence on foreign components technology for military systems limited our responses in commercial conflicts. Quite a bargain. The third proposition, in any case, is plausible: Europe and Japan have sufficient military capability and potentiality to alter the security structure.

Technology, Economy, and Theories of International Politics

National security, as we have always known, rests on economic foundations, on the ability to generate and focus resources. The changing balance of industrial and technological power among the western democracies simply brings this back into focus. A simple examination of the logic of the dominant approaches to international relations suggests that their limits and shortcomings make it difficult to address the present transformation. As with almost all social theory, the post-war

debate in international relations was devised to explain a particular world; theory was shaped by its initial problems. In this case that was a world divided in two with America dominant in its sphere.

Structural or realist theories focus on national units and implicitly equate power with military capabilities. Such theories assume or take as given the distribution of power they encounter. The structure then constitutes the bounds and limits of international politics.⁶² The underlying distribution of industrial capability itself is not a subject of explanation. The logic of the theory is inherently static; that is it cannot—nor does it make a claim to—systematically account for change in the distribution of capabilities or the type of capabilities that are most important as societies grow and change.⁶³ That the argument does not address how capabilities are generated within units is not a fault, merely a limitation of this particular line of argument.⁶⁴ That limitation matters little when the distribution is changing slowly, as was the case for much of the postwar period; it is critical when the distribution shifts rapidly and significantly. Of course war can extinguish or redistribute capabilities; one nation may capture the resources of another; alliances may form to add together resources. Yet short of capturing someone else's resources external strategies cannot affect the distribution of capabilities which define the structure. Alternatively a nation can extend its resources by internal action. The term internal balancing can easily be extended to encompass the development of the industrial base. International political economy does not offer us solutions to this limitation of structural theory. It has tended to set itself as an alternative to structural theory, rather than accounting for how the resource base of great powers expand and contract or how the currencies of national power change. The question of what defines or generates national power capabilities is, for the most part sidestepped. There are some elegant individual exceptions but the question has not captured the

subfield.⁶⁵ Studies of the rules and regimes of the international economy have not focused on how the market can be manipulated to redistribute capabilities among the advanced countries. Whatever the utility or limits of the arguments in international political economy for the purposes those in the debate set for themselves, the field does not centrally address the question of the conversion of wealth into power or the use of power to generate wealth. There are individual exceptions but the question has not captured the subfield.

The intellectual agenda was shaped by the central problems of the 1960s, 70s, and 80s: how an American dominated global economy would be ordered and then order maintained as American dominance of the West waned. The conventional theories of international political economy, which do not deny the insights of structural theory, have had two central thrusts. First, regime theories and game theories have in common a concern with the principles ordering interchange in the international economy. *Regime theory* arguments work like institutional arguments in comparative politics. Interplay is structured, and outcomes influenced, by the regime/institutional setting in which it takes place. The question in such arguments is always whether institutions are created by a particular power balance or shape the interplay amongst actors. The greater the independence a set of institutional/regime arrangements has from the particular issue or players, the greater its presumptive influence. Domestic institutions have a viability and solidity resulting from social habit, agreement, and law that are not characteristic of international organizations. International organizations are formed in what remains a fundamentally anarchic environment and are, inherently, more fragile.⁶⁶ *Game theory* is useful for suggesting the ordering logic in interchange, but too often the games are used as metaphors or selected because a situation is analogous to a particular game. The rigor of the method obscures the flimsy structure of the application. It hides the fact that if the

choice of game is open, that choice—not the logic of the game itself—may be the critical question. That is the choice of game explains more about a situation than the analysis of the game itself. The explanation of the choice of game is likely not to be found in a meta or supra game of games, but in the conceptions, domestic needs, and contingent play of elite actors.

In the second thrust, analyses of interdependence debate the limitations on national power, emphasizing transnational and multinational actors and government efforts to control and shape their behavior. The continued role of national power is acknowledged, indeed it is often reemphasized. Nonetheless, the debate does not focus on the links between wealth and power. Indeed, power is viewed as fragmented into separated arenas and distributed in distinct currencies. Converting between them is often thought to be difficult. (Consequently, one sometimes outcomes attributed to the fragmentation of power that are the result of the refusal of the United States to exert influence rather than to its lack of weapons.) International markets and societies have changed, but the case for the transformation of international politics is often overdrawn.

The real difficulty though is not which problems IPE treats or how, but what it does not effectively address or does not permit us to analyze with power. Theories of interdependence do not centrally confront the problem of how market processes, and government's manipulation of market processes, shift real power from one powerful nation to another. The studies in international political economy that really focus on the interplay of state and development focus on the emerging countries, not the advanced countries. Their insights about the ties between domestic development and the international structure are only indirectly integrated into the core debates about the dynamics of the advanced industrial democracies.⁶⁷ Indeed the IPE debate about the advanced countries has been almost a problem in comparative politics;

how to account for variation in national economic responses to common international economic problems with national level variables.

The issues raised in this essay suggest that a central problem for international political economy must be how international regimes or the structure of interdependence is manipulated by nations to create advantage. It is not simply order but order on what terms that matters. Nor is it simply a matter of which nations are makers of or takers from the system. Rather the question is how dominant powers generate advantage from influence over the rules of play in the trade and financial system. In a world of nation-states what is produced, and where, matters. The national production profile represents both a set of economic possibilities and security conditions. A nation rich from oil, timber, and agricultural exports is not the same as one wealthy from production of computers and new materials. Industrial structure and the dynamics of technological evolution may become necessary intellectual foundations for the student of international politics. Success in trade is not simply an alternative strategy to a security strategy.⁶⁸ Trading nations have lived in very particular balances of military power. More importantly, a trading strategy can serve as a means of creating the wealth to provide security directly, and the emerging military potential of Japan suggests just that.⁶⁹ The international political economy of significance must be about the central stories: how wealth and capabilities were created and redistributed; how regimes were arranged not simply to provide order but to extract resources; and the place of military and security policy in political economy.

A New Security Era

A new security era is upon us. The current security debate is still rooted in the past.⁷⁰ It is an argument about the level and form of American contribution to a

Western Security system with America at the center and its allies ceding the definition of crisis and response to us because they are dependent on our action for their own security. The new reality confronts us in pieces, in fragments and isolated controversies, but not yet as a whole. That new reality is that our major allies have the range of capabilities required to act on their own in the international system, to behave as great powers. Indeed the possibility of American dependence on our allies in the full range of policy arenas is real. Whether they use the capabilities to pursue their foreign policy preferences is increasingly a matter of domestic political choice. Our economy is no longer disproportionately large or so distinctively structured around advanced production and technology to create a fundamental foreign policy advantage. Industrial innovation is no longer the preserve of the United States. The areas of significant industrial weakness are extensive. Recall the weakness of the American production tool industries from machine tools and robots through semiconductor equipment. The possibility that technologies only obtained abroad will be sufficiently critical to provide leverage on our foreign policy is real. Financial power rests in institutions outside the United States, though for the moment the system is still organized around the dollar and American dominated international institutions. Only in the military arena do we maintain distinct technological advantages, though perhaps only for now. Yet here both Europe and Japan have the potential to put into place an autonomous military capacity. Within the decade European/Japanese technological alliances that excluded the United States—albeit an unlikely possibility—could displace American military leadership. Japanese claims that they are capable of building more sophisticated avionics than the United States or Europe are not to be dismissed, though their implementation is an aircraft generation away. The possibility in military components and electronic subsystems—if present development are unchecked—of dependence on foreign sources

is now emerging. That potential is new. Inevitably it must affect the balance of relations within the alliance, the price that our allies are willing to pay for our security guarantees.

At a minimum the formation of Western security policy will become more complicated. Real differences about the organization of international economic system as well as the risks and potentials in the remarkable events in Eastern Europe could become the basis of serious divisions. Allies will increasingly have to be accommodated, even given primacy. There are two implications. The first is clearly that the central security issues are the terms on which old alliances will work among coequals with similar but not identical interests. The second is that a continued erosion of America's international economic position is a national security issue. This does not lead to the conclusion that America should pursue a mercantilist economic policy. It does imply that our industrial structure is a security asset and needs to be perceived as such. For several years it has been argued that unless through domestic policy American industry maintained a competitive posture the nation could not maintain an open international trading system.⁷¹ Our industry's competitive position has continued to deteriorate creating powerful pressures for trade restriction. Now the stakes are raised; now we either maintain a competitive American industrial base or we will endanger not only the trade system but also our security position. The long standing question of the linkages between technology, wealth and power will have to be reconsidered and rethought. The American case provides the occasion to do so.

Notes

1. This is evident from the varied Department of Defense initiatives in commercial technology and the several Defense Science Board examinations of the issue.
2. This section draws on my work with Stephen S. Cohen, particularly the analysis of manufacturing. See in particular Manufacturing Matters (New York: Basic Books, 1987) and "Manufacturing Innovation and American Industrial Competitiveness" Science Vol 239, March 4, 1988 and "Business Economics and the Oval Office: Advice to the New President and other CEOs" Harvard Business Review Vol 66, No 6, November- December 1988.
3. Samuel P. Huntington "Coping With the Lippman Gap" Foreign Affairs, America and the World 1987/88 Vol. 66, No. 3.
4. Certainly this did not mean that the American economy has become like that of Mexico or Brazil. Our debt is enormous but it is still a small fraction of our GNP, and because that debt is almost exclusively denominated in dollars we fundamentally control its disposition.
5. There are a variety of indicators. 1) Policy must suddenly attract foreign capital to finance our deficit. 2) Some suggest that the stock market drop in 1987 resulted from the withdrawal for technical reasons of Japanese funds. 3) Japan, not the United States is now the World's largest source of foreign aid. 4) International debt relief plans turn on Japanese and European willingness to fund them, whether or not the names of various American Treasury secretaries are attached.
6. See Jacques Mistral and Elizabeth Kremp "Commerce exterieur American: d'ou vient, o va la deficit?" Economie Prospective International Vol 22 Paris CEPII 1985.
7. Congress of the United States, Office of Technology Assessment, "Paying The Bill: Manufacturing and America's Trade Deficit," OTA-ITE-390, (Washington D.C.: U.S., G.P.O., 1988)
8. Ibid.
9. See for example Shotaro Ishinomori Japan Inc. (Berkeley, Calif: University of California Press, 1988).
10. "Honda prepares to survive yen rise up to 120 to U.S. dollar," Japan Economic Journal, December 27, 1986.
11. Gary Hamel and C.K. Prahalad, "Strategic Intent" Harvard Business Review, May-June 1989.
12. Made in America (MIT, 1989) prepared by the MIT Commission on Industrial Productivity headed by Michael Dertouzos and Robert Solow develops many of the same arguments. What is most intriguing are not the arguments, which have been made elsewhere, or the excellent empirical material, for other cases exit, but rather the reluctant advocacy by such neo-classical stars as Robert Solow of positions that explicitly and implicitly break from the orthodoxy. Solow in particular however has retreated privately from conclusions he supported in the text.
13. The debate of course is how to account for such developments. Two lines of analysis abound. One, beginning with Alfred Chandler emphasizes strategic choices and organizational innovation. See in particular The Visible Hand: the Managerial Revolution in American Business (Cambridge, Mass: Belknap Press, 1977). A second beginning with Oliver E. Williamson, Markets and Hierarchies, Analysis and Antitrust Implications: a Study in the Economics of Internal Organization (New York: Free Press, 1975) emphasizes the question of transaction costs. My own view is that Williamson's approach is an awkward means of addressing historical developments. Its real use is reconciling economists to historical and sociological reality.
14. Benjamin Coriat has made the same point about flexible automation exceptionally well in an excellent unpublished article.
15. Michael Piore and Charles Sabel emphasize this model of flexible specialization. See The Second Industrial Divide (New York: Basic Books, 1984).
16. Gary Herrigel in Peter Katzenstein, Ed., Government and Industry in West Germany, (Cornell University Press 1989).
17. Ramchandran Jaikumar, From Filing and Fitting to Flexible Manufacturing: A Study in the Evolution of Process Control (Cambridge, MA: Harvard Business School, Working Paper, 1988).

18. Charles Sabel argues this in a variety of places. His best known work is Work and Politics, (Mass:Cambridge University Press).
19. Cohen and Zysman, Manufacturing Matters, *op. cit.*, Part One.
20. Cohen and Zysman, "Business, Economics, and the Oval Office," *op. cit.*
21. Robert H. Hayes, Steven C. Wheelwright, and Kim B. Clark, Dynamic Manufacturing: Creating the Learning Organization (New York: Free Press; London: Collier MacMillan, 1988.)
22. For the semiconductor equipment issues see Jay Stowsky "Weak Links, Strong Bonds: U.S. Japanese Competition in Semiconductor Production Equipment" in Johnson et. al. Politics and Productivity. *Op Cit.* For the machine tool and textile apparel cases see the work at MIT which has been synthesized in Made and America Michael Dertouzos ed. MIT Press 1989.
23. See Christopher Freeman, Technology Policy and Economic Performance: Lessons From Japan (London: Pinter, 1987) for the analysis applied to Japan.
24. John Tilton, International Diffusion of Technology: The Case of Semiconductors (Washington, D.C.: Brookings Institution, 1971), p. 76 and Michael G. Borrus, Competing For Control: America's Stake in Microelectronics (Cambridge, Mass.: Ballinger Books, 1988), Chapter 4.
25. Steven Vogel, "Japanese High Technology, Politics, and Power," Berkeley Roundtable on the International Economy, Research Paper #2, (March 1989), particularly Chapter 1.
26. Consider, for example, the VHSIC program (very high speed integrated circuit program) launched under the Carter administration to accelerate the move toward submicron technology and to integrate advanced circuits more effectively into systems. VHSIC seems to have proved largely irrelevant to the evolution of the semiconductor industry. Indeed military procurement now represents only 11% of the semiconductor market. By contrast, civilian computer and telecommunications represent 17% of the market. See Borrus Competing For Control, *Op. Cit.* and Leslie Brueckner, "Assessing the Commercial Impact of the VHSIC Program," Berkeley Roundtable on the International Economy Working Paper #5.
27. What are called heads up displays which place control information in the driver's line of sight and location technology for convenience and safety may soon be added features in more expensive models. Simple digital map generators can already be found in some Japanese cars.
28. See the work of Jeff Hart and Michael Borrus on HDTV.
29. Conversations with auto and electronics firms.
30. Philippe Delmas makes these points well in an unpublished paper. Military R&D is eliminated on the grounds that it is only of indirect effect on civilian technology either because of the character of the work or because it doesn't transfer easily. Basic science is eliminated because these efforts diffuse most rapidly into the international community
31. Jay Stowsky has made this point in "The Weakest Link: Semiconductor Production Equipment, Linkages, and the Limits to International Trade," *Op. cit.*
32. Generic technologies represent a category between basic research and specific application. A set of scientific discoveries may have to be translated into engineering problems. Once those problems are resolved, they can more readily be applied to specific products. Certainly a firm which controls entirely a generic technology can established enormous entry barriers for rivals. However, the fact that specific products are not at issue also permits company collaboration on such technologies. Both the Jessi project in Europe, the Sematech program in the United States and a decade ago the VLSI program in Japan represent such efforts. Knowledge about ceramics or for example may be developed for commercial uses such as engines or golf clubs as well as for military applications.
33. See John Zysman Political Strategies for Industrial Order, (Berkeley: University of California Press, 1977). This is in fact the central argument of the book, though the organizational arguments have generally attracted more attention.
34. Dosi and others have made this notion popular. See for example Dosi, Tyson, Zysman, "Trade, Technologies, and Development: A Framework for Discussing Japan" in Politics and Productivity, *op. cit.*
35. Made in America, *op. cit.*

36. Sandholtz and his colleagues have phrased the problem nicely: "In the short term, however, states frequently have to choose between them (power and wealth). Advanced and civilian technologies increasingly converge on the same key sectors. The overlap encompasses the whole technological base of the nation: its research institutions, its industries, its pool of scientific and technical personnel, R & D investment pattern, in short the entire framework supporting innovation. The dilemma is that military objectives for technological development may shape the technical base in ways that handicap the corresponding civilian industries, or that commercial R & D will not produce the applications." Wayne Sandholtz, Jay Stowsky, Steve Vogel, "The Dilemmas of Technological Competition in Comparative Perspective: Is It Guns vs. Butter?", Paper prepared for MacArthur Arms Control Seminar, Berkeley, Fall 1988.

37. These surplus economic resources involve much more than money for defense expenditure obtained through tax or inflation, but rather choices about trade and financial policy that structured options for business here and abroad. This was evident in its provision of market access and special treatment for Japan and the Asian Nics of security significance. It was evident in the use of foreign aid for political purposes. Those "surplus" resources, which could be defined as the ability to give up domestic production or consumption for foreign policy purposes without intense domestic political opposition, rested on our unrivaled financial and industrial position. They provided us the capacity to establish and control institutions in the global economy, and that capacity helped define us as a hegemon.

38. Indeed the notion that defense systems really have to work only once and thus do not need commercial standards of repeat performance are misleading. Defense systems really need to work the *next* time. That requires enormously high standards of reliability, standards best achieved through established components and system components and sophistication achieved through steady iterative development. Suddenly, that appears possible.

39. "Holding the Edge: Maintaining the Defense Technology Base," Congress of the United States, Office of Technology Assessment.

40. The basic notion of structural arguments of all sorts and not just those in international relations is that the arrangements of possibilities and constraints set the menu of choices actors face. Consequently, much can be said about the way individual actors will behave without examining the actors themselves. The same logic used by Kenneth Waltz underlies my own reasoning in my work on domestic politics.

41. The phrasing is borrowed from my colleague Steve Weber. The point is John Lewis Gaddis's.

42. In the end the logical limits of the structural theory itself are indicated by the problem of developing and sustaining the national capabilities on which structural theories are built.

43. Yoshitomi Masaru, "Japan as Capital Exporter and the World Economy" (New York: Group of Thirty, Occasional Papers #18, 1985).

44. Masuzoe and Yostomi.

45. Ishihara, Shintaro and Morita, Akio "The Japan that Can say "No": The New U.S.-Japan Relations Card," translation by the Department of Defense.

46. I am adopting here the conventional use of these words, though they are quite misleading. Here we use the term *sensitivity* to mean increased contact and exchange, *vulnerability* to mean sensitivities that are difficult to reverse, and *critical vulnerabilities* to mean those vulnerabilities that can threaten the stability of the political regime or the economy. See John Zysman, "The French State in the International Economy" in Peter Katzenstein, Ed., *Between Power and Plenty* (Madison: University of Wisconsin Press, 1978). The analysis of Kenneth Neal Waltz in the *Theory of International Politics* (Mass.: Addison-Wesley Publishing Co., 1979) closely parallels this position.

47. See for example Charles Tilly's discussion of the role of food in the creation of the nation state. Charles Tilly, ed., *The Formation of National States in Western Europe* (Princeton, N.J.: Princeton University Press, 1975).

48. See Phillip Wellons, *Passing the Buck*. Harvard Business School, Cambridge, 198-

49. Clearly my reading is similar to that of Ken Waltz, though we come to the same conclusion from very different starting points.

50. This section is drawn from Laura d'Andrea Tyson and John Zysman, "Development Strategy and Production Innovation" in Chalmers Johnson et al. ed. Politics and Productivity Ballinger, Cambridge, 1989.
51. T.J. Pempel in Peter J. Katzenstein, Between Power and Plenty: Foreign Economic Policies of Advanced Industrial States (Madison: University of Wisconsin Press, 1978).
52. Murakami Yasusuke, "Towards a Sociocultural Explanation of Japan's Economic Performance," in Yamamura Kozo, ed., Policy and Trade Issues of the Japanese Economy: American and Japanese Perspectives (Seattle: University of Washington Press, 1982).
53. Bela Balassa and Robert Lawrence reach the conclusion that Japan's trade structure differs from that of the other advanced countries. Saxonhouse applies Hechsher Olin models to reach different conclusions.
54. This conclusion is based on extensive discussions and interviews.
55. Most of this material is drawn from Wayne Sandholtz and John Zysman "1992: Recasting the European Bargain" World Politics October 1989.
56. Margaret Sharp, Europe and the New Technologies (Ithaca, N.Y.: Cornell University Press, 1986) Gerd Junne and Van Tulder make a related argument in European Multinationals in Core Technologies (New York: Wiley, 1988).
57. Masuzoe and Steve Vogel, op. cit.
58. Yakushiji Taizo, "The Dynamics of Techno-Industrial Emulation: An essay on the growth Patterns of Industrial Pre-eminence and U.S.-Japanese Conflicts in High Technology," Berkeley Roundtable on the International Economy Working Paper #15, Summer 1985).
59. Vogel, op. cit., p. 46.
60. As a result there is a real complementarity with Japan. Japan lacks system expertise, which it is seeking to develop on its own or in joint projects. Europe needs component technology, particularly electronics technology. There is a trade to be made. Indeed there was a substantial rumor that had the U.S. not proceed with the FSX that the French, Dassault in particular, would have offered to do so. The advanced technologies can be developed either as part of explicitly military efforts or as part of commercial projects with substantial spin-on technology.
61. I appreciate Steve Weber's insistence that when structural constraints weaken, perceptions begin to determine choice and evolution of events. Europeans interpret and react to changes in Eastern Europe differently than Americans. Indeed, evolution in Eastern Europe will contribute powerfully to developments in Western Europe. Alain Minc has argued that Western Europe was created by the Iron Curtain and would tend toward a different political logic if the symbol of the Berlin Wall were to be dismantled. Indeed, the concerns of 19th century European history, such as the nationalities question and the place of the German peoples, rather than the concerns of the post-war bipolar preoccupation with Soviet American balance, are asserting themselves. Conversely, if Gorbachev were to fail and a radical conservative or military regime take power, Western Europe would likely respond with a much more unified defense posture. Japan's strategic position and problems are quite different, one might speculate on a range of developments in Asia that might lead Japan to conclude that it requires a broader range of policy choice. Alternatively, American choices might provoke Europe and Japan responses. Radical cutbacks in American expenditures or an apparent unwillingness or inability of the United States to provide the common defense is one provocation. Or weapons systems such as SDI that reduce the equivalence of San Francisco and Rome or Kyoto in strategic reasoning would have similar consequences. Or American trade protectionism that left Japan uneasy would be another spark.
62. Sometimes those bounds are so tight that in a state of anarchy the choice of game, the strategies, and the outcomes are set; but usually there is usually more than one possibility, more than one arrangement of alliances and national strategies. Each alternate set of alliances and strategies emerges in the early and indeterminate interplay among nations when the possibility of a new structure emerges because the distribution of capability has changed. At the moment of creation a structure is indeterminate, dependent on a series of contingent events. Different possible lines of development can be imagined to carry different probabilities, each line occurring as a result of specified processes. Thus the emergence of the international structure or system within a particular distribution of

capabilities needs to be explained in most cases. In the often indeterminate translation from distribution of capabilities to structure or system, internal purposes do matter. Indeed, ideas or rules of play from one era shape the way in which the realities of a new era are formed. People formulate changes in their world and select their strategies through the conceptions they bring with them. Those ideas may be reformulated, but just as institutions show their past, they are powerful in the process by which new social forces take form. Once alliances and "rules of play" are in place, the political interplay within a system can once again be treated systematically in more traditional ways.[62] Though the alliances and arrangements are not as basic as the distribution of capabilities, they in turn are confining and provide order and hence predictability.

63. There is really no need to repeat here the core logic of this theoretical approach. At the center of structural theories is the distribution of national capabilities. Nations must provide for themselves, and their capability for doing so is thus central. The tasks and the possibilities are set in the international system by the distribution of those national capabilities. The core motivation, survival and expansion of power, is a function of anarchy. Consequently a logic of behavior can be derived from structure. The more compelling the tasks, the more confining the possibilities, the more precisely behavior—indeed the logic of play among nations—can be foreseen. When tasks are not urgent and choices diverse, the theory can specify the playing field and much about the logic of play, but neither strategies nor outcomes. Similarly economics can tell us a great deal about how perfect markets, which rarely occur, operate. It tells us much less about imperfect markets, which are pervasive.

64. It is a serious analytic error to treat theories as right or wrong, more or less powerful, rather than understanding their limits and exploring how different theories comply.

65. Robert Gilpin has considered the problem of the "empire cycle". Empires must generate gains greater than their costs, or collapse. Yet whether there is a cycle that sees costs grow and gains diminish or whether the capacity to continue to extract resources rests on policy at the moment is not convincingly argued. Some have tried to explain the policies and political configurations that permit some developing nations to resist multinationals (Stepan, Moran, Greico) or generate sustained development. However, the same analysis has not been applied to the relative position of the advanced countries. Indeed the studies of comparative adjustment (Gourevitch, Katzenstein, Zysman) avoid the tough question of whether variation in strategy accounts for important differences in economic success. The two way interplay between domestic development and international system has not been fully explored. Comparativists have taken the international system as a constraint defining domestic choices or a stimulus requiring domestic responses, while many international theorists wistfully hope for a theory that will exclude comparative politics. .

66. Theories of structural change and institutional constraint abound in comparative politics, exploring how the past structures the emergence of the future. There is an important difference between international and comparative politics however. In comparative politics often the underlying units—social class, social groups, parties or factions—are ephemeral but the social arrangement of institutions create a frame within which change occur. In international politics the units- nations tend to be stable but the institutions and ideas are ephemeral.

67. See for example the work of Stephan Haggard.

68. Richard Rosecrance The Trading Nation.

69. Hirschman's exploration of how nation's can exploit the economic dependence of clients to capture gains from trade is the counterpoint to rosecrance's notion of the trading state. Other than to remind us that power and trade are interconnected, Hirschman wonderful analysis of Germany's position does not directly illuminate the current story. In his case one nation exploited its dominance of a single other nation to impose terms of trade. The present story is how to structure and how to play the international system. The Japanese case is one of manipulation of the terms of access to its domestic economy and the terms of support for forays into international markets. The American case is directly a story of structuring and manipulating markets to extract gain, sometimes for firms and sometimes for foreign policy but rarely for national economic development. Certainly as hegemon we provided order and conditions for broad economic development. Fear of the term mercantilist and neo-mercantilist, a charge suggesting either economic ignorance or political isolationism, have hid from us the reality that nations can seek to extract gains from the international markets in different

ways and in different currencies. Thus comparative foreign economic policy becomes a part of the story of the change in relative global positions.

70. The entire issue of International Security 1989 Summer is rooted in the old reality. The basic debate, the character of containment and the place of the third world, is an extension of the post-war argument. How if our resources are now more limited ought we to proceed? An excellent question, and I certainly favor the notion of finite containment. However, only around the edges and then in the treatment of the changing Soviet position, does Walt, for example treat the changing parameters.

71. "Double or Nothing," *Foreign Affairs*, Zysman and Cohen