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Industrial Competitiveness and American National Security

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The debate on U.S. competitiveness must become a debate about national security. Relative decline in economic position and failing technological leadership will soon undermine the exercise of American power. Many argue that extensive foreign policy commitments have exhausted the economy's resources.1 Others point to an increasingly sophisticated and interconnected world economy, accepting that U.S. security must now rest, in part, on foreign technological and industrial capacities that lie outside of direct U.S. control.2 But these views fall short of considering the most fundamental transformation: American industrial and technological decline has eroded the foundation of the postwar security system. At the same time, industrial and technological initiative abroad is creating the basis of a wholly new system that could markedly reduce U.S. influence.

These concerns may seem laughably distant coming on the heels of America's remarkable military victory in the Persian Gulf and the collapse of the Soviet threat. To be sure, the Gulf conflict demonstrated the vast difference between a great power and the modest capabilities of a regional Third World power. The United States was able to mobilize the resources necessary to alter events half a world away; it could still project its will into a distant regional conflict. The combination of America's sophisticated electronic weaponry, command and control systems, and military strategists proved utterly dominant against a technologically and tactically overmatched adversary.

But U.S. military success in the Persian Gulf rests on past industrial strength; it is not a reliable indicator of future capacities. Even American weapons mastery rests on electronic components and subsystems largely designed in an era when U.S. industry dominated the civilian computer and semiconductor industries. That era is fading rapidly. Continued mastery is by no means assured because the economic base on which the U.S. international political position rests is at risk.

For four decades, the international security system presumed a fundamental Soviet enemy, a U.S.-controlled military umbrella over allies in Western Europe and Asia, and an international system of trade and finance (excluding the Soviet bloc) dominated institutionally and in the market by U.S. economic strength. Each of these pillars of the postwar security system has changed profoundly: The Soviet Union has collapsed; the American provision of military security for allies in Asia and Western Europe, once an economic and technological necessity, now endures only as a mutual political choice; and, finally, U.S. economic hegemony has been challenged by dramatic shifts in industrial and technological position. This third pillar, the changing economic foundation of the security system, is the central concern of our analysis.

American economic capacities have always been more limited than commonly perceived (creating, as Samuel Huntington has remarked, a "Lippman Gap" between extensive commitments and more limited resources).3 Not that those capacities are insignificant: The U.S. economy remains the world's largest, and its technological and scientific resources are still deeper and broader than any near challenger in Europe or Asia. But the relative U.S. position has changed substantially. Faster growth abroad was to be expected as countries such as Japan, Germany, and France rebuilt their domestic

economies, borrowing the best industrial practices, licensing technologies from the United States at modest cost, and successfully shifting resources out of agriculture into industry. But catch-up abroad did not simply restore a more traditional balance of economic power--the differential in growth rates continued, driven, in Asia especially, by accelerating productive investment. Today, the absolute level of industrial investment in the United States has fallen below that of Japan, though Japan boasts only half the population and GNP of the United States.4

Profound shifts in the United States's position in technology, trade, and finance will not be easily reversed. American technological leadership is now severely threatened in a range of important areas, including electronics. Increasing numbers of U.S. industries now retain their market position only through heavy doses of trade protection. And the United States has moved quite suddenly from its position as the world's largest creditor to become the world's largest debtor.5

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. There is little disagreement about this despite widely varying interpretations of the American decline.6 The issue, then, isn't whether the relative U.S. position has changed, but what significance to accord its decline.7 In our view, the change in American industrial position is hugely significant: It augurs a transformation of the international security system by upheaval at its economic foundation.

New Economic Dimensions of Security

Historically, the principal concern of security systems has been the control of territory and resources.8 For a nation, the question has always been how to preserve the community within national territory from outside intervention and control, while pursuing the community's shared goals in the external world.9 Traditionally, control and use of resources has required armed force. Now, however, private actors can control significant resources through markets, while governments influence their operation for national purposes. The security issues do not disappear, but they become submerged and hidden by market relations. As the threat of military conflict among the advanced countries dwindles and the influence of international markets grows, the question of how to achieve security must then become twofold: (1) How can a nation maintain security in the traditional sense of guarding its borders and resources? and (2) How can a nation preserve its economic integrity--that is, how can a nation's aims be preserved in the constraining web of international economic relations? Suddenly, market structure and market function become a matter of intense concern.

We may consider a nation's economic security in terms of its ability to generate and apply economic resources to the direct exercise of power, or to shape indirectly the international system and its norms. When allied nation-states are knit together into a shared security system, the power within the alliance resides with the nation that has the ability to get the others to act on its behalf or the wherewithal to put to its own use resources belonging to the other states. That can be accomplished directly through overt threat and punishment (or promise and reward), or indirectly when the structure of the system produces outcomes that serve the lead state's interests, or when the lead state's preferences become the alliance's accepted norms.10 In the postwar security system, the economic dimension was critical to the direct exercise of U.S. power. Industrial and technological resources supported U.S. military strength and underwrote the use of commercial and technical assistance to secure allied agreement with U.S. goals. And the economic dimension was just as critical indirectly in its impact on the system's structure and norms.

The economic structure of the postwar security system rested on multilateral free trade established by the General Agreement on Tariffs and Trade (GATT) and international financial stability embodied in the Bretton Woods and successor agreements.11 After the

war, the United States generally kept its market open while tolerating Europe's and Asians departures from free trade for the sake of their development. The United States, in fact, encouraged their development through extraordinary transfers of finance and technology. In turn, the United States benefited by selling technically advanced goods and services that others could not provide and then purchasing foreign assets with the surplus profits and overvalued currency.12 In this way, by both rewarding allies and extracting tribute from them, the United States channeled compliance for its policies in the security realm.13 Directly and indirectly, then, the U.S.-led security system has rested on industrial strength and technological leadership.

Now, from a position of dominance, America has begun to slide--risking dependence in industry, finance, and critical segments of technology. American industry's inability to adjust competitively to changes in global markets threatens to undermine the U.S. commitment to openness and the ability to achieve U.S. goals. America's ability to exact allied compliance, either directly or through structuring of the system and its norms, has diminished. Conversely, the allies need no longer covet U.S. technology or financial resources. In an increasingly large range of commercial technologies with significant defense application, Japanese components and subsystems and European manufacturing equipment and materials are broadly superior to American ones. The restructuring of Europe and the continuing rapid growth of an Asia dominated by Japanese economic resources reinforce the probability of autonomous regional actors and create the possibility of alternative regional security arrangements.

The Argument

This chapter builds the case that a transformation of the international system is under way and requires a rethinking of the basic concepts of security. The first section proposes that America's decline relative to its allies is fundamental, the result neither of catch-up abroad nor of imperial overreaching. Rather, it is the basic loss of industrial position that is undermining the economic and technological basis of the old security system. The second section examines the emergence and consequence of powerful new industrial capabilities in Japan and Europe.

Section III considers alternative technological bases for security by examining the changing ties between military and commercial technology. It suggests that military technology cannot rescue the commercial U.S. position--but commercial weakness can undermine military strength. Section IV explores whether or not the emerging multipolar economic system will produce a multiplier security system. The American, European, and Asian regions each have the political capacity and technic-industrial foundations for independent action. There are, moreover, disturbing indications that increasing regional autonomy will introduce new and severe constraints on U.S. policy--the kind of constraints that the United States has become accustomed to imposing, not accepting.

The fifth and concluding section argues that the new technological and economic foundations that are emerging could support any of a number of security structures. The distribution of economic capabilities does not, however, dictate the precise form of an alliance system. The alliance system will be a product of varied conceptions of strategic order, the national and domestic group interests at stake, and the particular crises that force old arrangements to be reconfirmed or new arrangements to be created.

Our analysis stands in marked contrast to the intellectual and policy debate now being formulated in response to the fragmenting of the former Soviet Union and the instability of the Persian Gulf. The emerging debate presumes that as American hegemony wanes (and even this is questioned to some extent), the security system will evolve toward mutual interdependence with continued U.S. leadership.14 The implication is that the existing economic structure of the security system--the distribution of capabilities--will also support mutual interdependence under U.S. leadership. In this view, a multilateral security system can be successfully managed by the United States. "Managed

multilateralism" can retrench America's security position to a defensible point consonant with its relative economic power. A repaired and strengthened system of open trade and stable finance can, in that view, continue to structure outcomes favorable to American interests. This would certainly be a preferred outcome, at least for America, of the current upheaval.

However, to presume interdependence as the natural successor to American hegemony misunderstands the processes driving the evolution of the international economy and their significance for the U.S. position. To be sure, the presumption of interdependence is supported by the increasingly global character of major firms. But it fails to acknowledge the stubborn reality of regional markets and local industrial communities, as well as the enduring role of national and regional policies. The temptation to choose between the global and national phenomena must be avoided; we must not deny one evolution by pointing to the other.15 Rather, the task is to sort out the interconnections of economic activity at the global, regional, and national levels--and then to understand the implications for security. In fashioning a new economic basis for security, the United States faces more than the simple choice between defending free trade or succumbing to nationalism. We must not view our options as an either/or proposition: either we strengthen general rules to sustain an independent multilateral system, or we act bilaterally to advance our position in a world of competitive regions. We must pursue a measure of both these strategies.

I. The Emergence of Vulnerability: America's Deteriorating Position in the Global Economy16

How deeply eroded is the American capacity to exact compliance either directly or through its position in the trade and financial system? There are two interpretations. One view is that the U.S. decline is mostly the result of the industrial catch-up of Europe and Asia which ended in the mid-1970s. The second view, presented here, is that the decline is more fundamental, and has been disguised by the process of catch-up, stagflation, and European economic troubles in the late 1970s and early 1980s.

To assess these competing positions gauging the depth of American decline, we must consider more than aggregate growth or trade figures. We must consider the evolution of industrial technology and the dynamics of international competition--an evolution that suggests that international markets for technology, manufacture, and finance no longer unquestioningly support U.S. industrial leadership. We must understand that the ability of the American economy to adjust to shifts in international markets and to the emergence of new competitors has substantially diminished. We must recognize that America's external debt is now a potential constraint not only on foreign policy, but on fiscal policy--a point that was brought home by recent contentions that continued American pressure for financial market deregulation would provoke a cut-off of Japanese credit. We must realize that all these developments represent new and serious constraints on U.S. power.

The Pattern of Decline

We see the overall picture like this: An emerging competitive weakness in manufacturing, increasingly visible in the 1970s, was accelerated and amplified by mistaken macroeconomic policies in the 1980s.17 America's competitive position began to shift in the 1950s and 1960s in the areas of textiles, footwear, and apparel. These were labor-intensive sectors at the time, and the shift seemed only to indicate a change in the composition of American domestic production; the United States was simply experiencing a natural adjustment of its economic might from labor-intensive to capital-intensive industries. But then from the 1960s through the 1970s, the capital-intensive industries also began to slide. The steel industry provides a good example. Imports of steel rose continuously through the 1960s as competitors from Europe and Asia emerged.

As imports rose, American steelmakers responded sluggishly, failing to fully participate in a production revolution from open hearth to basic oxygen furnace technology and from traditional to continuous casting. They never recuperated. By the late 1970s, American steelmakers were not just competing with foreign steel but were having to import the very production technology to do so. By becoming importers of the technology, U.S. steel firms condemned themselves to follow the innovation curve rather than lead it. This same cycle of rising imports, slow domestic response, and relinquishing technological leadership was repeated in other industries. The 1970s then saw the decline of manufacturing and capital equipment sectors--sectors that produced complex assembly consumer durables such as electronics, automobiles, and numerically controlled machine tools. In these sectors, too, American firms missed a production revolution originating abroad. Now, in the 1990s, a range of advanced technology sectors face intense international competition--including electronic materials and manufacturing equipment, semiconductors, displays and other component technologies, and electronic systems such as computers and office automation equipment. Even high-technology industries are losing market position and feel themselves under siege.18

In all of these sectors, there was a characteristic story of retreat culminating in decline. First, global market share began to drop, especially at home as imports flooded the domestic market. American firms usually responded by moving offshore to lower production costs through cheaper labor (if they had the resources) and simultaneously securing some form of bilateral restraint on imports to protect their waning domestic market position. The bilateral agreements established quantitative restrictions on the number of imported items. Placing quantitative restrictions on foreign producers' access to our domestic market encouraged them both to raise prices and to fill their quota by selling their more expensive items instead of less costly ones. This not only raised consumer prices but allowed foreign competitors to capture much of the gain. The policies served only to defer domestic competitive adjustment and even subsidized foreign firms that were becoming ever more competitive. For those who went offshore, the respite was short lived. As production processes became more and more spatially fragmented, integration of product and process innovations became ever more difficult. Finally, as the competitive position of U.S. firms waned, so did their capacity to spend on R&D and new product and process development. The principal sources of innovation and advanced technology development began to move abroad to competitors.

The problems in electronics bring this story of troubled adjustment into the 1990s and demonstrate how deep the loss of U.S. technological leadership runs. Postwar U.S. dominance of the electronics industry was premised on companies' producing complete products, such as computers, while having access to a highly competitive domestic market of independent component, subsystem, equipment, and materials suppliers. Even the most vertically integrated firms (such as IBM) depended on this supply network. Over time, those independent suppliers have been disappearing under competitive pressure from domestic Japanese producers. Today, large, integrated Japanese electronic systems firms control the supply of many of the essential underlying technologies, either directly through ownership or indirectly through group affiliation.19 This integrated (or group) character of the enterprises is important. Even if components and subsystems are sold on the market, they will almost certainly be made available within the Japanese firm or group first. Indeed, an increasing number of American and European companies, from high-end suppliers such as Unisys and ICL to micro suppliers such as Compaq, Sun, and Apple, sell name-brand computers that consist almost entirely of hardware technologies supplied by their major Japanese competitors.20 As competitive dependence in the supply base undermines computer product development, the technological initiative is increasingly passing to Japanese industry and they therefore dominate the fastest growing market segments.21

This story is repeated in other sectors of the U.S. industrial base. The United States is increasingly dependent on foreign supply of a broad range of industrial technologies

including manufacturing machinery, tools and robotics, precision mechanical and magnetic components, displays, optoelectronics, power supplies and control systems, and many advanced materials such as ceramics and ultra-pure silicon. All of these technologies are militarily significant. Advances abroad in all of them have come primarily through civilian markets rather than military spending. Equally significant, access to many of these technologies can be regulated because their supply is controlled by foreign producers with market power. Later we explore the implications of this situation in greater detail. For now, it simply suggests the degree to which U.S. technology development is becoming constrained by decisions abroad--something unprecedented, indeed almost the reverse of the established U.S. position in the postwar period.22

From Dominance to Denial

Why don't others see it the way we do? Numerous analyses assert the belief that American industrial position remains fundamentally sound and well prepared for political and market competition in the twenty-first century. In our view, these analyses ignore significant competitive troubles and pay little attention to the long-term constraints on U.S. behavior that those competitive troubles represent. The problems exist in finance, industry, and technological capability, and may be seen from a variety of different vantages.

Consider first the most obvious symbol of the changed global situation: the sudden shift by the United States from its position as the world's largest creditor to that of the world's largest debtor. That shift is also a useful initial lens through which to scrutinize the American economy and its position. For example, there is the issue of what we use debt for: A century ago, when the United States last was a borrower, debt served as an instrument of development that laid the foundation for long-term strength; overseas borrowings were invested in national development. Now, however, they are consumed, leaving only future obligation.

The debt, and the policy of consumption that led to it, has now begun to sharply constrain American fiscal and monetary policy. Macroeconomic management is constrained because substantially eroding the exchange value of the dollar is difficult. As Fred Bergsten argues, such actions could "put into jeopardy the huge capital inflow that remains essential to fund a trade deficit still running at about $100 billion."23 Such constraints rapidly begin to influence security position. A drooping exchange rate makes the projection of real power more expensive in domestic terms. The dollar cost of overseas operations, everything from United States Information Service (USIS) activities to military bases, goes up. The consumption of foreign product, including elements of security, becomes more expensive.

The U.S. net debtor position will not easily be reversed. Neither Japan nor Europe is ready to volunteer to absorb the massive American exports required over an extended period. Nor has it been simple to accomplish the more modest goal of eliminating the trade deficit, which continues to add to the debt. Certainly with the drop of the dollar, an export boom has begun over the past four years, a boom that has "ranged across virtually the entire spectrum of manufacturing industries. . . ."24 But just as the deficit and the accumulating debt were not in themselves evidence of radical industrial decline, the export boom is not in itself evidence of a resurgence of industrial competitiveness. Rather, we must look more closely.

This export boom has been sparked at a very low real exchange rate between the dollar and the other principal currencies. American industry can no longer compete at the earlier and higher exchange rates. This amounts to a real shift in the position of the American economy. By 1989, the United States was able to regain its 1972 share of world exports, but only because its manufactures were made extraordinarily cheap by a dollar worth radically less than its 1972 exchange value. Even then, the 1972 trade

surplus produced by superior U.S. export performance had been replaced by 1989's $113 billion deficit.25 Any country can have balanced trade; the question is, At what real exchange rate and at what real income? The trick is to maintain that trade balance with high and rising real incomes, essentially the definition developed at Berkeley for the President's Commission on Industrial Competitiveness.26 Unfortunately, average American real weekly earnings in the private sector (nonagriculture) peaked about the time of the first oil crisis and have declined ever since. So we have achieved an export boom by reducing prices (lowering the exchange rate) and reducing real wages. This is, simply, a real change in the national competitive position; our firms can compete, but on different and less attractive terms to the nation.

Shifting the angle a bit, compare the response of American and Japanese producers to currency shocks: The United States once had dominant positions in product and production, partly because it made products others could not make or could not begin to make competitively. Consequently, high American wages and a high U.S. dollar did not displace American producers from markets. Now, however, the situation has changed. The sharp increase in the value of the dollar in the early 1980s priced American goods out of many world markets and made imports a bargain. By the mid-1980s, the United States faced a soaring trade deficit and, with the help of the other major industrial countries, the so called G-7, began to devalue the dollar. But then came the real trouble: As the dollar progressively lost value against the yen, many American industrial producers did not regain their lost market position. In fact, the position of some advanced-technology sectors such as electronics continued to deteriorate. By contrast, Japanese producers of cars and laptop computers retained and even enhanced their market position as the yen rose in value. Japanese producers absorbed the exchange rate-driven price increases of the late 1980s; that is, they had priced to meet the market and accept lower profits.27 Roughly one-half of the yen's real appreciation was neutralized by a reduction in export prices relative to domestic prices. This did not happen in the United States, where pricing to market--absorbing exchange-driven price increases--was much more limited. Our sectoral observations suggest that determined Japanese firms successfully reorganized their domestic manufacturing operations to increase productivity and flexibly introduce new products as a means of defending market position. In 1987, major Japanese firms announced that they would remain competitive from a Japanese production base even if the yen rose to 120 yen to the dollar. In some segments of electronics, the principal Japanese firms believed they could remain competitive with the yen at 90 to the dollar.28 We will argue in a moment that such production innovation was possible because Japan is on a distinctive trajectory of production development.

Price elasticities in trade--the sensitivities of imports and exports to changes in currency values--are a related way of considering the real competitive changes. There is substantial debate on whether there has been a change in the trade behavior of American industries.29 It appears that there has been significant change at least on the import side: During the 1980s, each percentage decrease in the value of the dollar (making American goods cheaper and foreign goods more expensive) resulted in a smaller reduction of imports than it had a decade before; conversely, each percentage increase in the value of the dollar (making American goods more expensive and foreign goods cheaper) produced a greater influx of imports than it had ten years prior. That is to say, for example, that if in 1977 a 10 percent devaluation of the dollar reduced imports by 7 percent, in 1988 that same devaluation reduced imports by only 4 percent; and if in 1977 a 10 percent rise in the dollar led to a 5 percent increase in imports, in 1988 that same rise gave way to a 9 percent increase in imports.30

This trend is consistent with the observation that a substantial increase in American imports has been concentrated in automobiles and electronics over the past decade. Much of the deficit in these sectors is in products American producers do not make or undeniably do not make as well as the Japanese, so we would expect such imports to be

less sensitive than formerly to price changes. That real sectoral shift in competitive position represents a change in the industrial structure of the economy. It is consistent with econometric evidence that a given rise in domestic prices produces a larger inflow of imports than when American producers made a distinctive basket of products or made the products distinctively well. By contrast, the same evidence suggests that there was not a change in the price elasticity of exports. This appears to be an artifact of the composition of U.S. exports: What U.S. companies continue to sell well abroad (e.g., agriculture, chemicals, aircraft) is as sensitive or insensitive as they have always been to price changes.

A final way we might judge the relative decline of the U.S. position is to consider the troublesome composition of our trade deficit. The mix of imports that our deficit embodies is evidence of changed industrial position. If American auto producers and consumer electronic producers were highly competitive with their Japanese counterparts, then we would import fewer cars and VCRs. We might, rather, import all of the French wine harvest or traditional Japanese artifacts and crafts. Recent studies of advanced countries' trade patterns have recategorized all of the sector-level data to examine this problem.31 They show a radical loss of U.S. position in traditional and scale-intensive industries such as textiles and consumer durables, and in production equipment (capital goods) and materials sectors, where, for two generations, American producers have dominated. These latter sectors in particular embed substantial industrial know-how and, as we argue below, provide an important foundation for future growth. By contrast, Germany and Japan have maintained or gained position in traditional, scale-intensive, and production equipment/materials industries. Moreover, relative to the United States, Japan has claimed position in advanced-technology sectors. The relative inability of American producers in diverse sectors to compete in global markets has shaped not only the composition of our trade deficit but also our industrial base.

The perspectives just examined above suggest a very different story about American industrial development than the conventional tale that was presented in the early 1980s. At that time, a positive face was placed on trade deficits in older industries: The deficits were supposed to represent a shift upward out of declining labor-intensive into expanding technology-intensive industries, a shift out of "sunset" into "sunrise" industries.32 The apparent decline in these supposedly mature sectors was claimed to be a source of strength for the economy as a whole. Unfortunately, the sunrise-sunset distinction simply misinterpreted many of the processes of industrial development. High-tech sunrise sectors largely make producer goods: equipment, components, subsystems, machinery, and advanced materials used to produce or develop final products for consumers. The sunrise-sector goods are applied across the economy to help transform production and products in traditional industries. The traditional industries are vital clients. Without demand from the traditional sectors for high-tech products, the domestic component, systems, and equipment producers cannot develop.33 Conversely, this supply base of component and equipment producers embodies vital skills and knowledge to help sustain production and product innovation in their clients. This interlinked character of industry, this industrial fabric, matters.34 Rather than cause for optimism, the shift out of sunset industries boosts real elements of concern: The U.S. inability to maintain position in "mature" sectors, conjoined with the success of Germany and Japan in the same sectors, suggests that U.S. firms have a limited ability to reorganize manufacturing and apply new technology. This simultaneously weakens the advanced-technology sectors of the domestic economy by eroding their customer base.35

Our interpretation that the late 1980s resurgence of American industrial production does not indicate a return to an equivalent competitive position is supported by recent comparisons of the advanced industrial economies.36 The United States is certainly one of the wealthiest countries in the world. But it is revealing to decompose the measure and source of its wealth, and to compare those with the sources of wealth of the other twenty-

five richest countries. First, consider gross national product (GNP) per resident. Here the United States ranks second. However, in gross domestic product (GDP) per resident--which excludes imports and exports--the United States ranks only fourth. The gross domestic product in manufacturing per inhabitant tells a worse story. The United States ranks eighth, behind France and barely ahead of Denmark. This position is a radically new development. In 1965, the same measure placed the United States in the first position. By 1973, the United States had fallen to third position. In 1981, the United States had fallen to fourth position and by 1984 to tenth--a total of nine places between 1965 and 1984; America's current resurgence regains only two of those places.

Perhaps this erosion of U.S. manufacturing position does not matter. Can't the service sector substitute for manufacturing? This issue has been examined in detail by Stephen Cohen and John Zysman.37 Our position is that services cannot substitute for manufacturing as a means of supporting either the relative domestic standard of living or the U.S. international trade position. Critical areas of the service sector are linked to manufacturing, and their capacity to support income growth will erode as manufacturing loses position. Indeed, the drops in real wages examined earlier in part reflect the exit from manufacturing to services employment. Service industries will also not compensate for manufacturing's trade deficit. Not only are internationally traded services a small fraction of total trade, but the U.S. position in services is weakening, as the relative position of American banks and other financial intermediaries suggests. The U.S. competitive position is not likely to find solace in the myth of the postindustrial service economy.

Neither can comfort be found in the observation that the American share of global GDP, after declining until the mid-1970s, has since remained stable.38 The GDP figure is very deceptive. The continuing U.S. position rests not on excellent performance, but on an economic slowdown in Europe in the 1980s. By contrast, growth rates in Asia have remained higher than in the United States; the U.S. position relative to Asia and Japan has continued to decline. For security purposes, that relative decline matters. That the United States has been able to "hold its own" with a temporarily sclerotic Europe is hardly reassuring. A European resurgence without a parallel American boom would diminish the U.S. position further.

Finally, can "soft power" substitute for a decline in industrial position? American ideas, values, and culture have been widely admired and have almost certainly extended U.S. influence. More importantly, they have often given legitimacy to our power. But the role of soft power should not be exaggerated: it is a weak hand to play in an era of decline. Espousals of democracy cannot, for example, compensate for delays in providing real resources to aid the transformation of the Soviet Empire. The spread of American culture may extend our influence for a time, but it has been the economic wealth of the United States that has transmitted our culture in the first place. As our economic position declines, so certainly will the influence of our soft power. The culture of a declining power does not command acquiescence. Japan is now the model explored in the endless airport paperbacks: Germany is the centrally debated alternative for a France looking for guidelines for its own future.39 Unbacked by real influence from economic power, our culture, our "soft power," may even eventually elicit contempt or dismissal--the weapon of a paper tiger. Debates in Japan and Europe about weakness in our society suggest that may already have begun.

The Political Meaning of Economic Decline

What is the political meaning of these economic changes in U.S. finance, trade, and technology positions? Stripped of political context, these economic statistics understate the loss of political position. They cannot capture the political significance of European integration, German unification, or the rise of Japan. These are new, autonomous players whose emergence challenges the old constructs of American influence. To appreciate the

relative decline of the U.S.'s political position, we can compare the percentage of American GDP to the GDP of its two largest autonomous competitors over the past two decades.40

In 1970, the two largest fully autonomous western competitors to the United States were Britain and France. In that year, American GDP was 3.7 times that of the two combined.41 In 1970, the American GDP was also 2.5 times the combined GDP of Japan and Germany--larger economies, but not yet politically autonomous. By 1990, Japan and Germany had become autonomous political players, and the relative size of the combined economies had roughly doubled. In 1987, the American GDP was only 1.3 times that of Germany and Japan combined. The 1987 indicator even understates the change in the balance of power, because since 1987, differential growth rates have continued and the two Germanies have become one. Finally, of course, if the European Community (EC) is considered a single actor for purposes of this comparison, the situation would be even less favorable to the United States.

America's economic position relative to its two strongest allies has gone from almost 4 to 1 in 1970 to virtual parity by 1990. To be sure, translating economic resources into political influence is another matter, but it is clear that the relative economic position of the United States has changed sharply. Political consequences are surely inevitable. As we learned from the Gulf War, the American capacity to extract compliance from its allies in the security system has already diminished. Politics among nations is only beginning to reflect this real change in capabilities. Consequently, recent history is no guide to the rest of the decade.

II. Innovation Abroad and Constraint at Home

The American position in global manufacturing competition has changed abruptly.42 After World War II, the United States made things others could not produce, and what others could make, American firms often made better and more cheaply. America's dominant industrial position rested on a system of mass production and divisionalized management that emerged in the late nineteenth and early twentieth centuries, and that was strongly supported by domestic policies favoring consumption.43 These real innovations in the organization of production and corporate control were responses to the particular circumstances of American economic development.44 Other countries tried to catch up. They sought to imitate what we did; they saved and invested to do so. But they never really did imitate the United States. Rather, the most successful innovated and built the basis for advantage in global markets.

Two aspects of postwar development in the foreign advanced countries concern us: policy and production. The two stories intermesh. Consider first the policy questions. Our most successful competitors, such as Japan and Germany, chose to emphasize investment in production over consumption, creating macro conditions for rapid growth. In both cases, governments encouraged the rapid adoption and widespread diffusion of technology acquired abroad, and helped provide for a corresponding skilled workforce. In Japan, the government went a step further. Not only did government stimulate new investment through a variety of tax incentives, but by formally closing the domestic market to foreign firms, it reserved growth in domestic demand for Japanese producers. As technology followers, Japanese firms borrowed, implemented, and improved foreign technologies through continuous rounds of reinvestment in the rapidly growing domestic economy. In essence, Japanese firms faced conditions in traditional industries that Americans associate with high-technology industries--rapid growth and technological development forcing dynamic adaptation through investment and learning. Learning economies dominated, making the pursuit of market share a necessity to sustain short-term profits.45 Continuous rounds of new production investment, supported by rapid growth policies, helped to create a virtuous cycle of productivity gains. Each new round provided an opportunity to experiment with production, achieve new scale economies,

adopt and refine new technologies, and build an iterative pattern of learning while doing so. Real innovations in production and in technology development were generated and accumulated. Japanese approaches to institutional structure and economic policy thus created patterns of market logic (and subsequent corporate strategies) distinct from other nations.

Accompanying these new government approaches to rapid growth come innovations in production and production organization in countries as diverse as Japan, Germany, and Italy. Our hypothesis is that these breakthroughs are of sufficient scope and power to alter the relative position of nations.46 What is emerging is not incremental or even radical improvement of an old system, but a new approach, a new paradigm. Elements of these breakthroughs are found in the U.S. industries, but the evidence is that the new approach is not as well established or as diffused in this country as it is elsewhere.47

The detailed character of the production revolution is increasingly understood and documented.48 The central code words of the new manufacturing are flexibility, speed, and quality. The popular notions of quality circles, just-in-time delivery, and automation--slogans of the new approach--are simply organizational or technological elements of the whole. The flexibility of the new manufacturing, rather than these slogans, better signifies the revolution in production. Manufacturing flexibility consists of two important capabilities: static flexibility and dynamic flexibility. Static flexibility is the capacity to vary product mix on a single production line or to automate batch production; dynamic flexibility is the capacity to introduce new production methods and new products without significant disruptions to existing set-ups and practices.

The organizational and technological innovations that permit flexibility have actually been implemented in a variety of forms. One form that has attracted considerable attention is so-called flexible specialization.49 Popular in northern Italy and parts of Germany, this model involves an attack by smaller firms on niche markets. It is built on craft skills and on local community infrastructures that permit shifting ties between firms that compete one day and collaborate the next.

By contrast, the most powerful implementation of the new manufacturing involves flexible volume production (labeled variously as flexible automation, flexible mass production, and lean production).50 Until recently, high-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 items. Introducing variety was very costly because it disrupted production runs and incurred significant costs by requiring long set-ups and substantial down time. Now, organizational innovation, reinforced by microelectronics, has removed past constraints. The new approach creates the capability of producing a variety of tailored products with costs, quality, and market responsiveness far superior to mass production.

Japanese firms have been the most successful at implementing this new production system by creating, as Jon Krafcik has noted, a relatively "lean" manufacturing process that tends to use less capital, fewer people, and produce less waste than traditional mass production.51 The lean production approach is characterized by shorter production runs manned by smaller teams of multiskilled workers operating less expensive general-purpose machinery that can be rapidly changed over for new production set-up with minimal down time.52 Line workers are given responsibility for strict process control in order to eliminate (systematically) variability in manufacture (the major source of defects). In turn, elimination of defects and rapid changeovers eliminate the need for carrying inventory and permit parts to be delivered as needed--"just in time" for production--further reducing costly inventories. Tight process control and the multi-skilled work team also eliminate the costly layers of supervisory, maintenance, housekeeping, and quality control personnel that characterize mass production. Significant gains in product quality without increased costs are one landmark result of the overall system. Even when very long production runs in the tradition of mass production are used (as in the manufacture of common underlying components such as

semiconductor random access memory) the result is higher yields and lower costs due to better equipment utilization and superior control of the sources of defects.53 The truly remarkable competitive power, however, comes from the inherent flexibility that shorter production runs provide. Indeed, the new manufacturing system is designed to accommodate change in both the static and dynamic senses identified earlier (i.e., varying product mix and accommodating new production methods that permit wholly new products).54

The new flexible manufacturing system actually extends beyond the shop floor into product development and to suppliers. Tight links between design, development, and manufacture permit "design for manufacturability"--with minimized parts counts and mutual accommodation between product and process requirements--resulting in the lowest possible anticipated costs and fastest development cycle times. Tight links to skilled suppliers, often structured through partial ownership and long-term business relationships, permit suppliers early involvement in product definition, aim at assessing and reducing overall costs, and permit a fair allocation of costs and returns between suppliers and final producers. Finally, the whole system lends itself to automation without becoming rigid. The overall result is great flexibility in production and greatly reduced total cycle times, thus enabling superior market responsiveness. Indeed, the flexible, speedy production capability permits the leading firms to do their market research by introducing a new product and then adjusting to customer reaction, fine-tuning product configurations and volumes to actual demand.55

Many aspects of this new production model--for example, the changes in accounting practice required to express management choices in terms of speed and capital productivity rather than labor costs--are still being worked out and remain to be fully described and theoretically supported. But the new practices are already transforming traditional industries--generating vertical disintegration in many cases, new entry in other cases, and prying open established industrial structures.56 The new forms of production suggest a sharp break from practices dominant in the middle part of this century and pave the way for realizing the huge gains in productivity that have been promised but not yet delivered by the application of information technology to production.57

That potential is strongly underlined in the remarkable work of Ramchandran Jaikumar, depicting the historical evolution of the technology and management of process control.58 He argues that manufacturing has evolved through six stages, each representing a change in how people thought about and practiced manufacturing. At each step, manufacturers addressed and ultimately controlled different major sources of variance in production, leading to order-of-magnitude advances in productivity and quality (using product rework as a measure of quality). Jaikumar's first three stages are: (1) the original emergence of machine tools in England, (2) the establishment of the American system with measurement, special-purpose tools, and interchangeable parts, and (3) the Taylorist system of managing the time and motion of labor. Each stage reflected an increase in production scale, increased specification of tasks before production began, and more rigid control of the system once in operation. That rigidity meant the system was quite static, capable of only limited response to the unexpected inside or outside the production system. Taken together, these stages culminated in the post-World War II American system of mass production.

By contrast, Jaikumar's next two stages introduce a much more dynamic manufacturing capability and are intimately related to the new production innovations described before. Those stages are (4) the introduction of statistical process control and other means of identifying and systematically controlling the sources of variance, and (5) the introduction of automation through information processing and numerical control. These factors create more dynamic and adaptive capacities because they require increasingly detailed specification of the production process and enable anticipation and response rather than rigidity in production. Combined with the accompanying

organizational innovations described earlier, these stages culminate in the current model of lean and flexible production.

The sixth step, on the horizon with no leader yet established (and perhaps somewhat beyond current technical and organizational capacities), is the emergence of truly intelligent and fully integrated systems of computer-controlled manufacturing (i.e., computer-integrated manufacturing--CIM). Taken together, the last three stages promise near-real-time adaptation to market changes with extraordinary levels of flexibility, productivity, and quality. In short, when new information technologies are added to the dramatic changes in organization and management, the current transformation in manufacturing practices may well have the potential to generate discontinuous leaps in performance and innovation. If the past is any guide--and Jaikumar's work suggests that it is--such a discontinuous jump in production capability will create distinct competitive advantages for firms and nations that master the new system. As we argue in the next section, it could place them on a more rapid growth path at least until the new capabilities fully diffuse to others.

In our view, America's relative decline reflects a failure to understand, access, and adopt the innovations in policy and production that underlie superior industrial performance abroad, especially in Asia. Myth and flawed practices have also deterred the competitive responses of U.S. industry.59 There has been an unwillingness to acknowledge that fundamentally different practices are at the root of the competitive problems. Many executives believed that technological leadership could be maintained indefinitely even as manufacturing mastery was ceded to competitors, or that foreign labor or cheap capital costs rather than production innovation lay behind superior performance abroad, or even that refined techniques for financial management made long-term strategic planning, production reorganization, and technology investment unnecessary.60 Many U.S. firms have finally begun to overcome these myths. They are slowly undertaking a strategic reconceptualization of the firm and its place in the market and the community--the necessary prerequisite to adopting new production innovations.61

Although the glimmer of change is hopeful, the decline in industrial position and relative incapacity to adjust to the new production model will be difficult to reverse for several reasons. First, although some firms are changing, many more have not even begun to reconsider their practices and strategies. This is particularly true for the bulk of small and medium-sized U.S. manufacturers throughout the domestic industrial base, as foreign manufacturers doing business with them affirm.62 Second, even those U.S. firms making the necessary changes have discovered that, once displaced from markets during the period of the high dollar, they no longer have product or cost advantages that permit them to recapture their lost position. Third, as the next section argues, the altered industrial position is leading to dangerous dependences that constrain the ability of U.S. firms to adopt the new production model.

Diffusion and Adjustment: The Risk of Competitive Dependence

Far more has been lost than simple market position in specific sectors. Rather, the supply base of the economy is unraveling: The components and parts technologies, materials and machinery sectors, and related industrial skills necessary to sustain competitive manufacturing and development are eroding, or are already gone.63 For example, competition in the past decade has devastated domestic producers of manufacturing machinery, including advanced industry segments such as computer-numerically controlled machine tools, robotics, and semiconductor photolithographic equipment. U.S. dependence on foreign supply of such machinery has increased dramatically since 1988, with imports rising from 14 to 40 percent of domestic consumption.64

Table 1-1 similarly shows that, in electronics, U.S. producers are broadly dependent on foreign supply of a huge and growing list of essential component, materials, and

machinery technologies. Indeed, most U.S. computer firms can no longer produce consumer-like products (e.g., laptop and smaller PCs) without an alliance with Japanese firms to provide the necessary components, micro-design know-how, and relevant manufacturing skills--Compaq with Citizen Watch, Apple with Sony, Sun with Fujitsu and Toshiba, and Texas Instruments with Sharp. Even IBM is not immune from this trend. The U.S. General Services Administration recently noted that IBM's RISC System 6000 model 7013-540 computer has a foreign content in excess of 88 percent.65.

Table 1-1 Gaps in the U.S. Technology Supply Base

Precision-mechanical

* Motors--flat, high torque, sub-miniature
* Gears--sub-miniature, precision machining
* Switch assemblies--sub-miniature

Packaging

* Surface mount, plastic

Media

* Magnetic disk
* Optical disk

Displays

* Electroluminescent
* LCD, color LCD, LCD shutter
* CRT--large, square, flat
* LED--arrays
* Projection systems

Optical

* Lens
* Scanners
* Laser diodes

Feromagnetic

* Video heads
* Audio heads
* Miniature transformer cores

Copier-printer

* Small engines for laser printers

Source: National Advisory Committee on Semiconductors

Of course, the significance of this competitive dependence is open to debate, particularly where required technologies are readily available from abroad. In industries such as textile production, for example, several U.S. producers (e.g., Milliken) have been

able to remain competitive through rapid adoption of machinery imported from a variety of competitive European sources. Other American industries have fared less well, however. In consumer electronics, U.S. producers became competitively dependent, lost the capacity to keep pace with product and process innovations occurring abroad, and, eventually exited the market almost entirely. Similarly, U.S. automobile producers face a weak domestic parts and components supply combined with difficulty in accessing supplier innovations abroad.66

In electronics, existing dependencies appear slowly to be creating a cumulative knowledge gap that is profoundly disturbing in its security implications: Even when they can procure technology inputs from abroad, U.S. firms no longer retain many of the design and manufacturing skills necessary to use them in a competitive fashion. For example, Japanese producers have painstakingly acquired, iteratively over several product generations, the precision mechanical design expertise embedded in products such as VCRs, or the precision machining know-how in auto-focus camcorders. A leading U.S. industrial laboratory recently reverse-engineered such products and concluded that the embedded precision mechanical skills probably no longer existed anywhere in the U.S.67

These are serious challenges to America's security position because components, materials and equipment manufacturers increasingly control the technological advances in product and production know-how that help to shape competitive performance. Competitive dependence will increasingly constrain the adjustment of U.S. producers by deterring access to appropriate technologies in a timely fashion at a reasonable price.

The Architecture of Supply and the Trajectory of Technology

It is not the fact of dependence on foreign producers itself that concerns us. It is rather the "architecture of supply"--the structure of the markets through which components, materials, and equipment technologies reach U.S. producers.68 Again, by the supply base of an economy, we mean the parts, components, subsystems, materials, and equipment technologies available for new product and process development, as well as the structure of relations among the firms that supply and use these elements.69 The supply base can be thought of as an infrastructure to any given firm, in the sense that it is external to the firm but broadly supports the firm's competitive position by helping to delimit the range of its possibilities in global markets, while providing collective gains (e.g., technological spillovers) for the economy as a whole.70

The supply base affects producers by enabling or deterring access to appropriate technologies in a timely fashion at a reasonable price. The architecture (or structure) of the supply base matters to the extent that it influences such technology access, timeliness, and cost. Domestic industry that is significantly dependent on a foreign supply base (i.e., on imports of key inputs) will not be overly constrained wherever markets are open and competitive, and foreign suppliers are numerous, geographically dispersed, and not in the same lines of business as their customers. This was essentially the case for European electronics systems producers from the 1950s to the 1980s: They relied primarily on U.S. components suppliers, who were themselves competitive, numerous, located in both Europe and the United States, usually not in competition with their customers, and accessible through relatively open markets for trade and investment. Indeed, it was not until the competitive problems of U.S. chip producers threatened a much more constraining architecture of supply for Europe in the 1980s that European companies moved at great cost to re-create a locally controlled supply base.71

By contrast, domestic producers should be concerned where the architecture of supply is characterized by closed markets, oligopolistic and geographic concentration, and, especially, wherever such concentrated suppliers compete directly with their customers. When suppliers have the ability to exercise market power or to act in concert to control technology flows, or when markets and technologies are not accessible because of trade

protection, then the architecture of supply can significantly constrain competitive adjustment to the disadvantage of domestic industry. Such an architecture is emerging today in American electronics production: A small number of foreign suppliers, principally Japanese, are more and more driving the development, costs, quality, and manufacture of the technological inputs critical to all manufacturers. Most of these suppliers of electronic components, manufacturing equipment, and subsystems are also competitors in a range of electronics systems from TVs and portable phones to computers. These competitors are then increasingly in a position to dictate the degree of access U.S. producers have to essential technologies, the speed at which they can bring new products incorporating them to market, and the price they pay for the privilege.72

The supply base architecture thus becomes a crucial element of international competition for domestic industries. It has an even greater significance, however, for the domestic economy. The architecture of supply and the composition of domestic production together delimit the technological opportunities that are perceived and pursued within a domestic economy.73 They define a technological development trajectory that reflects the community and market context within which technology evolves.74

Such development paths are not dictated by technical knowledge alone. Historical studies of technical change suggest that technological advance is open-ended rather than preset by scientific blueprints. Development, production, and use--and the learning they entail--shape the evolution of technologies at least as much as does scientific research. Technology is a path-dependent process of learning in which tomorrow's opportunities grow out of product, process, and applications activities undertaken today.75 Consequently, the pace and direction of technological innovation and diffusion are shaped by production and market position.

In this view, technological know-how cannot simply be acquired through international market mechanisms; otherwise, there would be no possibility for distinctive national development trajectories. To be sure, some technical knowledge is purchasable in disembodied form, such as a blueprint or a dress pattern. Even more know-how is embodied in products and can be accessed through purchase and elaborated through use. But much technical knowledge involves additional, often more subtle insights that coalesce only in conjunction with experience in development and production. The process is simultaneously cyclical and incremental--rather than a dramatic leap up to the next rung in the ladder of technological progress, advances are driven through iteration and cumulative learning by doing in production.76

This kind of technological knowledge differs considerably from pure science and is supported by different practices and institutions. Scientific knowledge, with its theories, principles, and premises, often can be precisely specified and easily communicated in a common language. Western institutions of science boast a history of openness, are international in scope, and permit information to flow readily across national borders. By contrast, the technological knowledge generated in production and development usually accrues locally and, under the right circumstances, can be kept from diffusing for considerable periods of time.

As local learning occurs, such know-how accumulates in firms as a skilled workforce and proprietary technology and techniques--all of which are usually difficult to copy because they have been painstakingly acquired through iteration over time. Such technological know-how also accumulates in local communities in the production networks of suppliers and contractors, and in social networks among technical peers. It can also amass nationally in the cumulative skills and experiences of the workforce and in relevant national institutions (e.g., national laboratories, universities, or specialized agencies that diffuse technology, such as the U.S. Agricultural Extension Service).

The speed and degree to which such embodied technical know-how flows across national boundaries depends crucially upon the character of these local and national institutions. In the United States, labor mobility is very high, firms can be purchased

outright, and short-term capital market constraints often push firms to license proprietary technologies. Social and production networks are relatively open and fluid, and many relevant national institutions are accessible (e.g., universities and national labs). In general, U.S. technology accrues locally but diffuses rapidly even across national boundaries. By contrast, in a country such as Japan, skilled labor mobility is low, acquisitions are virtually impossible, patient capital (i.e., capital willing to wait for returns) is available, and relevant networks and national institutions are extremely difficult to access. As a result, considerable accrued technological know-how is retained locally in Japan and never diffuses readily or rapidly across national boundaries.

Because know-how can accumulate and be retained locally, the character of the domestic economy and the architecture of the supply base supporting it can dramatically shape the availability of national technological opportunities. It is our hypothesis (which we elaborate more fully in Section IV) that three regional supply architectures will emerge in Asia, America, and Europe. The structure of each--the mix of skills, components, subsystems, equipment, and technological ideas--will powerfully affect the terms on which international competition evolves. Rather than global markets displacing national economic foundations, we see regional structuring.

Those regional architectures and the technology development trajectories they support will influence the speed and extent of adoption of the new model of lean, flexible production, and thus of competitive adjustment in each region. In our view, the American architecture of supply is increasingly limiting. Capacities to access and adopt the new production model are severely constrained, as is access to the technologies essential to the new model's future evolution.

Competitive Dependence and Defense Capabilities

There are real implications for America's defense position. Boldly put, why can't we simply depend on foreign suppliers in an open international economy? Theodore H. Moran, for example, contends that the threat of foreign control is a function of how few or how many firms are relied upon in a given defense industry, but not of the nationality of firms per se. Therefore, according to Moran, the most dependable method for minimizing the threat of foreign control is simply to diversify and multiply the companies upon which a nation can draw for its technology base. In Moran's construct, the potential for foreign control decreases in direct proportion to the proliferation of suppliers (irrespective of their nationality). As we have implied by contrast,77 corporate nationality can still matter a lot and policies aimed at the proliferation of suppliers are an inadequate response in cases where a small number of firms, all located in one country, already dominate a world industry. Corporate nationality matters if it bears at least some relationship to influence and control. As our colleague Stephen Cohen maintains, "We do not yet live in the age of the 'global corporation' nor, in its logical concomitant, a world of politically undifferentiated spaces. We should not assume that all multinational corporations [MNCs] are the same. All Home countries do not treat their MNCs the same; and all Host countries do not de facto set the same conditions for behavior on all MNCs."78

We agree with Moran that ownership should not be the defining consideration for U.S. policy; behavior should. Behavior reflects both ownership and residence. It is corporate behavior--what companies do and don't do within a country and with that country's people--that directly determines the wealth and power of that country. Ownership, as we learned during Wall Street's recent takeover binge, still influences corporate behavior. As Moran's own work demonstrates, even the most global of multinationals will take orders from their home governments when circumstances are exceptional. The reaction of American-based MNCs to Reagan Administration entreaties against the proposed Soviet-European gas pipeline is an instructive example.

As we argued in the previous section, domestic industry that is significantly dependent on a foreign supply base will not be overly constrained wherever markets are open and competitive, and foreign suppliers are numerous, geographically dispersed, and not in the same lines of business as their customers. Where we differ with Moran, is in the degree to which one can presume an international economy already characterized by substantial globalization and interdependence. That is one vision, and a desirable one, especially given the security order it would imply, but it is not the only possible future. The United States response to foreign competition and foreign direct investment should certainly include policies aimed at creating the conditions of an ideal global, interdependent world--where strategic industries are structured by a large number of companies, located in a large number of countries. But economic security policy cannot be confined to encouraging a proliferation of suppliers in the face of a very different, preexisting competitive dynamic; that is, in cases where a small number of firms, all located in one country, already dominate a world industry. This, we have just shown, is occurring in electronics.

Legislating absolute and universal rules to deal with situations that are so far from universal and absolute seems to us to be the wrong approach.79 Domestic producers need to be concerned when the international supply base on which they depend for critical inputs is characterized by closed markets, oligopolistic and geographic concentration, and especially when such concentrated suppliers compete directly with their customers. When suppliers have the ability to exercise market power or to act in concert to control technology flows, or when markets and technologies are not accessible because of trade protection, a universal rule will not do. The United States needs to promote a diverse and open international market in advanced technologies. But the United States will not be able to access this international supply base without having resident in the US the essential skills and production capabilities necessary to apply technologies available abroad. Assuring the domestic supply base is the only means of achieving the goal of openness and interdependence.

The innovations abroad in production and policy that have helped to create competitive dependence are simultaneously providing a new and different technological foundation for the security system. As the next section argues, not even America's superior defense technology capabilities are likely to rescue the United States from this dilemma.

III. Spin-Off versus Spin-On: Old and New Defense Technology Trajectories

The industrial economy is eroding at precisely the wrong time for America's security concerns. American military technology will not rescue the commercial U.S. position. Rather, a weakening commercial position will almost surely affect U.S. capacities to develop military technology and systems. The links between military and commercial technologies are shifting, and so is the relative contribution of each to security. Consequently, national military capabilities must be reassessed and their compass redefined. That reassessment will not be easy because it will depend upon the always contingent details of technology development at a given historical moment.

The relations between the civilian and military industrial sectors change over time. Commercial factors have always influenced the technological opportunities available to support the U.S. security position, even as military spending has shaped the civilian economy's composition and character. The relative contribution of each to security and the domestic economy shifts; the movement is closer to a pendulum than a progression. Early on, development of mass production and interchangeable parts was accelerated by military demand for rifles during the Civil War. The two World Wars saw the organizational and technological innovations of commercial mass production establish America's ability to churn out huge numbers of tanks, guns, and planes. In those days, the defense production base grew directly from the commercial production base. The

precursor to a new model of technology development was taking shape, however, as directed government spending created new defense technologies including radar, artificial rubber, the atomic bomb, and the rocket.

The new model fully took hold in the United States after World War II, helping to create a new technological development trajectory. The model was premised on the belief that putting investment into science at the front end of the development pipelines would produce technology at the other end. Military and related spending (e.g., space exploration) supported the enormous development costs of relevant new technologies. Initial applications were developed for (and procured by) the military, and later would diffuse--"spin-off"--into commercial use. In this way, U.S. defense spending promoted the rapid development of jet aircraft and engines, microelectronics, computers, complex machine tools, advanced ceramic and composite materials, data networks, and a host of other relevant technologies.

Very often, the model worked well to establish both defense and civilian technology leadership. In the jet aircraft and semiconductor industries, for example, government priorities helped to set the functional characteristics of the emerging technologies, R&D funds accelerated the development of the technology, and military procurement at premium prices constituted a highly effective initial launch market.80 A variety of mechanisms, ranging from patent pooling to loan guarantees for building production facilities, helped to lower entry costs, diffused technology widely among competitors, and set the stage for commercial market penetration. U.S. defense policy thereby helped to create advantage and foster competition in the later style of Japan's Ministry of International Trade and Industry (MITI).

That kind of technology development trajectory continues in some instances to be successful for the United States. Recent commercial spin-offs from military spending include local area networking, gallium-arsenide components, massively parallel computing, and algorithms for data compression. But even in the heyday of U.S. technological leadership, this development model had occasional problems in transferring technologies from defense to civilian markets in a timely and competitive fashion.81 For example, the U.S. Air Force supported the development of numerical control technology for machine tools building advanced aircraft. The programming language proved too complex for general commercial use. Diffusion was slow and civilian application costly. In this case, the spin-off trajectory produced only a commercially vulnerable U.S. industry that was squeezed by Japanese competitors from the low end and German firms from the high end.82 The foreign competitors benefited from different development trajectories. The Japanese built around MITI support and low-cost, simple technology for general-purpose commercial applications. The German craft tradition of high-quality capital goods, and its institutional support in local government, trade associations, and universities, fostered cost-effective numerical control (NC) technology for high-precision commercial uses.

As the NC experience demonstrates, there are competing technology development models. Massive resources committed in specialized defense contractors to technology produced in batch processes for initial use in military projects constitutes one development trajectory. Massive resources committed to commercial development produced in volume for consumer markets constitutes a separate trajectory. The former is the development model that has underpinned U.S. leadership of the postwar security system. The latter has underwritten the increasing Japanese success in commercial markets. The problem for the security system is that the latter trajectory is proving to have increasing military relevance.

From Spin-Off to Spin-On

A completely alternative military technology development trajectory is emerging from the innovations in production and consequent reshuffling of markets examined earlier.

This alternative drives technological advance from commercial rather than military applications. Technology diffuses from civilian to defense use rather than vice versa, a trajectory characterized as "spin-on" in contrast to its predecessor. The new alternative is prospering most fully in Japan, where an increasing range of commercially developed technologies are directly, or with minor modification, finding their way into advanced military systems.83 In particular, militarily relevant sub-system, component, machinery, and materials technologies are increasingly driven by high-volume commercial applications that produce leading-edge sophistication, with extremely high reliability but remarkably low costs.

The case is clearest in electronics, where a new industry segment is being defined in Asia, largely outside of U.S. control and with only limited U.S. participation. Its distinguishing characteristic is the manufacture of products containing sophisticated, industrially significant technologies, in volumes and at costs traditionally associated with consumer demand. Such products include the latest consumer items, such as camcorders, electronic still cameras, compact disc players, and hand-held TVs, and new micro-systems, such as portable faxes, copiers and printers, electronic datebooks, laptop computers, optical disk mass storage systems, smartcards, and portable telephones. This "high-volume" electronics industry is beginning to drive the development, costs, quality, and manufacture of technological inputs critical to computing, communications, the military, and industrial electronics. At stake is a breathtaking range of essential technologies from semiconductors and storage devices to packaging, optics, and interfaces.

Such products contain, for example, a wealth of silicon chip technology, ranging from memory and microprocessors to charge-coupled devices (CCDs), and have been a principal factor behind the drive for Japanese semiconductor dominance. Over the past decade, emerging high-volume digital products have grown from 5 percent to over 45 percent of Japanese electronics production, accounting for virtually all of the growth in domestic Japanese consumption of integrated circuits (ICs).84 With this segment continuing to expand at 22-24 percent per year, more than twice as fast as the approximate 10 percent per year average growth rate of the electronics industry as a whole, high-volume electronics will constitute an ever-larger part of the electronics industry of the next century. Its impact on the component technologies that military systems share is just beginning to be felt.85

Aside from silicon integrated circuits, militarily relevant optoelectronic components such as laser diodes and detectors, LCD shutters, scanners, and filters are also present in the new high-volume products. For example, the semiconductor lasers that, at different wavelengths, will become the heart of military optical communications systems, are currently produced in volumes of millions per month, largely for compact disk applications. Displays and other computer-interface technologies provide yet another significant overlap of high-volume and military markets. Miniature TVs from Japan are the leading users of flat-panel, active matrix, liquid crystal display (LCD) technology--a technology that is just beginning to infiltrate military systems. Map navigation systems beginning to appear in automobiles are the functional equivalent of military digital map generators.

Optical storage was refined for consumer compact and laser discs, but is likewise beginning to spread into military applications, as are the latest miniature commercial power technologies (e.g., batteries for portable phones). High-volume requirements are also driving a wealth of imaginative packaging technologies that range from tape automated bonding and chip-on-board to multichip modules. Producers of hand-held LCD TVs already use packaging technology as sophisticated as that being used in advanced U.S. defense systems. The new electronics products are driving similar innovations in precision mechanical and feromagnetic components such as motors, gear and switch assemblies, and recording heads, transformers, and magnets. Ball bearings

used in videocameras, for example, are now of equal precision to those required for missile guidance systems.

Successful production for high-volume markets also requires mastery of several different kinds of highly responsive product development, materials, and manufacturing skills. For example, Japanese consumer producers, such as Matsushita, now supply the most advanced manufacturing equipment for IC board insertion, a capability essential for military systems production. Similarly, because elaborate repair and maintenance are not cost-effective in consumer markets, high-volume producers deliver product reliability levels that often now surpass military products at far less cost. The most advanced high-volume electronics suppliers, as we have noted, do their market research by introducing products and fine-tuning product configurations and volumes to meet actual demand.86 They are the masters of the new manufacturing--utilizing an extremely short and efficient development cycle, and flexible, low-inventory manufacturing.

In sum, the basic technological requirements of new consumer products now approach, equal, or at times surpass those needed for sophisticated military applications. They have also begun to share a common underlying base of components, machinery, and materials technologies. There are several significant implications. First, by spreading the huge development costs across many more units, high volume markets can support the development of advanced technologies previously initiated only by military spending. Second, price-sensitive consumer applications demand that the unit cost of the underlying technology components be very low. For example, auto producers will pay an order of magnitude less for semiconductor component technologies than would contractors applying the same or similar products to military systems. Low consumer product costs cannot be achieved by reduced functionality or reduced reliability, since, for example, a real-time processor for engine or brake control on an automobile is a very sophisticated element incorporated in systems that must not fail in operation. The necessary low costs can be achieved only by the scale, scope, and learning economies of the revolutionary production approaches detailed in the previous section. The end result is that new, militarily-relevant generations of cheaper but sophisticated and reliable technologies emerge from high-volume commercial markets.

Moreover, the new production model's emphasis on speed of product development and rapid cycling of technology introduction has additional, critical military consequences. Using the strategies and production capabilities of the new manufacturing, Honda and Toyota can now take an automobile from design to showroom in less than three and one-half years. This is twice as fast as traditional mass production even though, with the incorporation of electronics and other new technologies, automobiles pose highly complex systems development problems akin to military product development (albeit with different performance parameters). Imagine the implications for military system development, plagued as it is with cycle times that incorporate technologies often two generations old, technologies that are advanced as design begins but old by the time production starts.87

It is a plausible hypothesis that civilian developers who have mastered the new manufacturing can move complex systems from design to battlefield faster than traditional military suppliers. They are better organized to do so. The very concept of 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 to jump to the extreme limits of the technically feasible at the moment a system is conceived. Rather, the most effective route may well be the iterative innovation that Japanese firms have mastered.

Product development done through an endless series of small innovations may not be heroic. It can nonetheless outpace product development that attempts to jump dramatically from one frontier to the next. As IBM's former chief scientist, Ralph Gomory, put it:

The process of repeated incremental improvement . . . an existing (not new) product gets better and develops new features year after year. Though that may sound dull, the cumulative effect of these incremental changes can be profound. . . . If one company has a three-year cycle and one has a two-year cycle, the company with the two-year cycle will have its process and design into production and in the marketplace one year before the other. The company with the shorter cycle will appear to have newer products with newer technologies. But, in fact, both companies will be working from the same storehouse of technology. It is the speed of the development and manufacturing cycle that appears as technical innovation or leadership. And it takes only a few turns of that cycle to build a commanding product lead. [Emphasis added.]88

Of course, given its incremental character, the limits to the cyclical development approach will be reached whenever the development of wholly new technologies is needed. Nonetheless, the new approach shows every prospect of producing a wide range of established military systems with equal or superior technology and capabilities, but faster, far more cost-effectively, and with greater reliability in the field.

Will America Adapt?

The American military technology system is not well positioned to accommodate the new alternative--neither to integrate the new high-volume technologies into military systems in a timely manner nor to support the commercial development on which military technology now heavily depends.89 Neither the financing nor the organization of the American R&D effort adequately comprehends the emerging reality of high-volume commercial technology development. Although the level of American R&D remains high, expenditure is dominated by military needs. Conversely, by international standards, the civilian effort is low, and the part financed privately is very low.

Similarly, traditional concerns about diversion and overpricing of scarce resources (and about controls on the commercial diffusion of dual-use technology) gain new significance when confronted by directly competing commercial technology development efforts abroad. National scientific and engineering resources are limited at any given moment. Government funding of military applications can divert essential personnel from civilian efforts and make them more expensive by bidding up salaries. This can make commercial efforts less cost-competitive and can even push domestic firms to move development efforts offshore. Similarly, dual-use restrictions and export controls discourage firms from leveraging commercial markets for military technology development. In a world of government-sponsored commercial R&D efforts, commercial products all too often are developed outside the United States from the same generic technology as that which underlies American military systems. The spin-off approach may thus delay rather than facilitate both commercial position and mastery and improvement of militarily relevant technologies.

Perhaps more important for security, the old system has created a domestic military-industrial enclave that is profoundly unlike the commercial world and organizationally unprepared for the emerging competition. Project bidding and accounting procedures involve selection criteria that amount to highly politicized speculation about future cost, performance, and procurement, and inherently limit incentives to develop the most cost-effective technologies. The consequent mechanisms installed to control abuse compel highly bureaucratic management approaches. Indeed, firms dependent on the military for research and production contracts adapt their organizational structures to market to the Pentagon.90 This leaves them with business strategies and organizational structures ill-suited to the commercial world.

Civilian and military initiatives represent two different ways of developing advanced technology. Technical sophistication, high reliability, low costs, faster development cycles, and flexibility characterize the emerging commercial-based trajectory, best

represented by the Japanese model. It is a trajectory rooted in a different community and market context than the military-spending trajectory that still dominates in the United States--a "spin-off" trajectory that, as Jay Stowsky argues in Chapter 4, no longer works. Besides the obvious advantages of cost and efficiency, this commercial-based trajectory may be better suited than traditional military spending to respond to the unpredictable regional conflicts that are likely to characterize the next century. This trajectory would also produce a very different technological foundation for the U.S. security position.

For the United States, the shift from spin-off to spin-on and the potential conflict between commercial and military trajectories pose severe policy questions. Is the American approach to military development obsolete for its own purposes? Is it counterproductive for the long-run development of the national industrial base on which militarily relevant technology development rests? Military spending and military technology development are not going to rescue the civilian economy from its competitiveness problems. Nor can they ensure sufficient national technological development even for security purposes. As the next section argues, these are disheartening conclusions for an America slowly ceding its influence to regional autonomy.

IV. Autonomy with Interconnection: The Regional Economic Structure of Security

The preceding sections have argued that U.S. capacities have declined and new capacities have arisen abroad. This section contends that, as a consequence of those developments, new patterns of economic dependence and autonomy are emerging which amount to a fundamentally new industrial foundation for security: The international economy is becoming a multipolar system organized around three distinct regional groupings. This alters not only the American security problem, but the very structure of international politics as profoundly as the changes in Eastern Europe or developments in the Gulf.

Enduring national power rests on the capacity to respond to external challenge by marshalling economic, technological, and military capacities to support national goals. When the global distribution of technological and industrial capacities changes, national patterns of external dependence and autonomy also shift. 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 developments that displace established military systems, can quickly change relative national positions. Consequently, national economic capacity itself must be understood as a dynamic concept, capable of significant shifts over time.

A nation's economic capacity is in great part a function of the internal political economy of the nation. That capability, which Kenneth Waltz calls internal balancing (in the discourse of international politics), is more or less equivalent to positive industrial adjustment (in the discourse of those concerned with the economy).91 Measuring a nation's dynamic capacity (internal balancing or industrial adjustment) requires a look inside the nation-state, at the root of its capacity, and at how it may be evolving. Labels such as "superpower" must be avoided. Such terms embody in advance a definition of who is capable of internal balancing, of acting politically to extend economic and technological resources to respond to external challenge.

The structure of the international system--the distribution of national capacities--has changed. The purposes to which the new capacities will be put are yet to be defined for Europe or Japan, and may be defined anew for the United States. The alliances formed to pursue as-yet-undefined threats are not evident. But if our argument is right, the international system that emerges in the next decade will be very different from the one constructed by American hegemony, and perhaps much less congenial to U.S. interests.

A Multicentered Global Economy

A more global international economy is visible in trade, direct investment, and finance. Products, companies, and investments from each of the major industrial regions can be found in almost every market on earth. International financial markets of enormous scale and significance have emerged over the past twenty years; yet, global wholesale banking rests firmly on national foundations, and retail financial models remain national. There may be a more global international economy, but that does not end the importance of place--community, district, nation, or region. Economic strategies and responses to new competition are generated within particular places, rather than by world corporations that stand outside a home base. Multinational corporations may someday be able to act without national constraint, but not yet. Firm strategies and tactics are formed within particular institutional arrangements and supply bases that at once constrain and direct their choices.92

There are three distinct, though interconnected regional economies, each with its own economic and technology base: Asia, North America, and Europe.93 The United States/Canada and Western Europe each represents about 25 percent of global GDP. In 1987, Japan accounted for 12.4 percent; and Japan plus the East Asian newly industrialized countries (NICs), 15.8 percent, of global GDP.94 The latter region will continue to expand in relative size because growth rates in Japan and Asia are substantially higher than in the United States or Europe. The Asian and European regions are increasingly distinct from one another in economic character, driven in recent years more by intraregional than external ties.

What are the indicators of distinctiveness? Consider foreign direct investment (FDI) and the much talked-about role of the border-leaping transnational corporation (or multinational corporation--MNC). In the view of some, the emergence of the transnational corporation is creating an integrated global economy. Indeed, foreign direct investment grew much faster than world trade between 1983 and 1989, expanding at a rate of almost 30 percent compared to under 10 percent for world exports.95 Roughly 80 percent of the flows during this period took were within the three major regions, suggesting a further integration of the advanced countries. But if we look closer, the regional pattern reemerges and hints of American weakness appear. First, as Sylvia Ostrey notes, "a significant aspect of the 1980s FDI wave is what appears to be the emergence of regional strategies by the triad's MNCs, leading to the likely formation of investment blocs and thereby also hastening intraregional trade integration. The clustering pattern which is emerging among the countries shows each region dominated by investment from a single triad member: the Americas by the United States; Asia by Japan; and Eastern Europe as well as selected African countries by the E.C."96 That is, the transnational corporate investment flows are themselves shaping three global regions. Second, even as three regions are being created, Japan (principally) and Europe (secondarily) have spent the 1980s entrenching themselves in the American market. The United States has become the most prominent recipient country for FDI, in part the mirror of its huge trade deficits, receiving almost half of the annual flows throughout the decade. Japan has become the principal source country, also a mirror of its large and entrenched trade surplus. So, much of the flow of Foreign Direct Investment reflects the changing position of the United States from source to recipient, its transformation from a country whose companies used their technology and organizational advantages to implant themselves in host markets into a host country itself.97 Thus the dominant American position in investment, as in technology and trade, has receded.

Direct foreign investment over the last decade in Asia has constructed a Japan-centered industrial economy and pushed the United States out of its position of pre-eminence.98 Europe's move toward greater integration with the 1992 plan, and its financial and political concomitants (e.g., the EMS, perhaps a European Central Bank), are creating an equally autonomous region. But weighing the evidence to select between a proposition of globalization and a hypothesis of regional separability, or trying to measure how far we have come along the road to a global economy, misses the point. We

must interpret the pattern in the fabric in order to understand how international markets are interwoven into regional economies.

That is why the economic interconnections between the regions should not be exaggerated. 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.99 Critical vulnerabilities, those that threaten the stability of the political regime or the economy, are not new either. Rather, the issue is whether sensitivity (and especially critical vulnerability) to developments outside immediate control can be reduced or countered. Although economic interconnections have grown, so has the capacity of national governments and industries to respond. National capacities to prevent interdependencies from threatening the regime or economic stability have grown even faster than the interconnections themselves. For example, compare the advanced countries' capacities to respond to external shock and stock market disruption in the 1970s and 1980s with the economic and political dislocations of the 1930s.

However, national capacities to respond to and shape ties to the international system, and to adapt domestically in response to international challenges, vary dramatically. They vary with both political and economic constraints. National capacities to establish position in the global system are a function of (1) the relative size and power of the national economy and (2) the political and administrative capacities of the national government. Therefore, the critical issue is not the extent of interconnections but their structure (which countries hold the strongest position), and how nations respond to their character. (Some interconnections pose greater problems of vulnerability than others.)

The structure and character of interconnection among the three regions will be fixed by policy choices and market dynamics. National and regional differences will shape the character of international trade and investment flows. For example, Japanese firms can obtain American technology and know-how by acquiring U.S. firms, but such acquisitions are virtually impossible in Japan. Many European countries are attempting to shape the impact of foreign direct investment with a variety of policies including local content requirements. The United States is not. Europe and Japan are both seeking and increasingly establishing independent technological bases. They are attempting to ensure the foundations of national autonomy through domestic action.

The conviction is widespread in Japan that it will be the dominant technological power by the end of the century, if not before.100 European governments, the Community, and major European companies are increasingly investing the resources required to overcome existing weaknesses and play to technological strength. There is a growing belief, almost a conviction, that Europeans can reestablish themselves as leading players on the world stage. Meanwhile, the U.S. government assumes that market development will ensure its future position in technology and industry.

Each region has the capacity for internal balancing and, the existing resources 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. Our concern is that America is substituting dependence for dominance, while thinking it is establishing an interdependent world of managed multilateralism.

The Asian Economic Region

Consider first the Japan-centered Asian trade and investment region. By almost any significant measure Japan, rather than the United States, is now the dominant economic player in Asia. Japan is the region's technology leader, its primary supplier of capital goods, its dominant exporter, its largest annual foreign direct investor and foreign aid supplier, and, increasingly, a vital market for imports (though the United States remains the largest single import market for Asian manufactures). Japan's own economy is decreasingly dependent on other world markets for growth. Japan's export dependency

dropped from a high of 13.5% of GNP to just 9.5% in 1989, signalling the economy's reversion to its historical level of domestic demand-led growth.101 Despite this, Japan's trade with the rest of Asia in 1989 surpassed her trade with the United States, more than doubling since 1982 to over $126 billion.102

Trade within Asia has grown faster than trade between Asia and other regions since 1985.103 By 1988, intra-Pacific Basin trade had risen to almost 66 percent of the region's total trade, from about 54 percent only eight years earlier.104 The major source of imports for each Asian economy is usually another Asian economy, most often Japan. In the late 1980s, for example, Japan supplied on average about one-quarter of the NIC's imports (versus America's 16-17 percent). Indeed, Japan supplied well over 50 percent of Korea's and Taiwan's total imports of technology products in the late 1980s, more than double the U.S. share of technology imports to either. Conversely, the NICs have increased their share of Japan's imports of manufactured products, from 14 percent to 19 percent between 1985 and 1989.105 Over that time frame, increased intra-Asian trade has permitted the NICs to reduce their dependence on the U.S. market, with U.S.-bound exports falling from one-half to one-third of total exports.106

Financial ties further reinforce intra-Asian trade trends. By 1990, Japanese industry was investing about twice as much in Asia as was American industry.107 From 1984 to 1989, there was as much direct Japanese investment in Asia as in the previous thirty-three years, thus doubling the cumulative total.108 Japanese investment in the Asian NICs grew by about 50 percent per year, and by about 100 percent per year in the Association of Southeast Asian Nations (ASEAN) nations. Perhaps even more indicative, in several emerging Asian economies, cumulative NIC direct investment in the second half of the 1980s surpassed the cumulative U.S. total (by as much as five times greater in Malaysia).109 Moreover, the use in Asia of the Yen as a reserve currency is expanding sharply.

The result of such trade and investment trends is a network of component and production companies that make Asia an enormously attractive production location. That regional production network appears to be a hierarchy dominated by Japan. Japanese technology lies at the heart of an increasingly complementary relationship between Japan and its major Asian trading partners. Japanese companies supply technology-intensive components, subsystems, parts, materials, and capital equipment to their affiliates, subcontractors, and independent producers in other Asian countries for assembly into products that are sold via export in third-country markets (primarily in the United States and other Asian countries).110 Conversely, nonaffiliated labor-intensive manufactures and affiliated low-tech parts and components flow back into Japan from other Asian producers. Summarizing these trends, MITI noted in 1987 the "growing tendency for Japanese industry, especially the electrical machinery industry, to view the Pacific region as a single market from which to pursue a global corporate strategy."111

As noted above, Japanese investment seems to be pursuing that strategy with a vengeance. In auto-making and electronics, there appear to be two key elements to the strategy. One is to spread subsystem assembly throughout Asia, while persuading each government to treat subsystems originating in other Asian countries as being of "domestic origin."112 The second element is to keep tight control over the underlying component, machinery, and materials technologies by regulating their availability to independent Asian producers and keep advanced production at home. The two elements together would tend to deter too rapid a catch-up by independent producers to the competitive level of leading Japanese producers, while simultaneously developing Asia as a production base for Japanese exports to the United States and Europe to avoid bilateral trade frictions.

In sum, advanced products and most of the underlying technologies are thus dominated by Japan, with labor-intensive and standard technology production in the periphery of the region and often under the control of Japanese industry. As a result, there is resistance to these patterns by other Asian countries. In a sense there is a

competition of corporate and national development strategies. The Koreans seek to break their technological dependence with national technology programs implemented by the large chaebol firms. The Taiwanese, Thais, Malaysians, among many others, marshall policy to their local circumstances in an attempt to reshape the existing regional division of labor. To some extent, all of the region's economies seek to emulate some of the developmental policies and business strategies responsible for Japan's success. But the developmental competition is likely to reinforce Asian autonomy even if it relaxes Japan's control over the division of labor.

For the foreseeable future, though, the character of Japanese development and policy is crucial to an understanding of the region's potential for autonomy. Modern Japanese history is in a sense the story of the self-conscious pursuit of economic development as a means to respond to external constraint. 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 then acted strategically to create a market system, the conditions for rapid growth, and industrial/technological development. Since World War II, strategic economic development has provided a foreign policy tool for nations who could not achieve influence in the international system by force or threat of force. As Section II described, Japanese industry and government policies of protection and promotion acted together to restructure the domestic economy and to create competitive advantage in global markets and comparative advantage in ever higher valued-added and technologically advanced industries.113 In essence, Japan shaped the character of its links to the international economy as a means of changing its place within the international system.

The basic elements of an autonomous development strategy are still in place. As Japanese firms have become dominant in some sectors in world markets, the Japanese economy has become more open. However, in the advanced-technology sectors, old patterns have continued, especially domestic closure combined with intense internal competition to develop products and technologies originating in Japan or borrowed from abroad. Relative autonomy is readily apparent in trade, investment, and technology.

In trade, for example, Japan still tends not to import in sectors in which it exports and, despite progress, its overall level of manufactures imports is still quite low.114 Although manufactures have doubled to account for about 50 percent of Japan's imports, that is still far below the level of the United States and Germany, each with 75-80 percent. Moreover, the recent upsurge in imports is at least as much a story of the regional adjustment of Japanese industry to the Yen shock as of the opening of the Japanese economy. Quantitative studies of Japanese imports suggest that in technology-intensive sectors, imports are tied to Japanese firms, a finding backed up by MITI surveys indicating that perhaps half of manufactured imports reflect intrafirm transfers between Japanese companies and their affiliates in foreign countries.115 Comparing equipment purchases by subsidiaries of Japanese, European, and American firms in Australia is likewise revealing.116 European and American firms buy equipment widely on global markets; Japanese firms buy almost exclusively from Japanese suppliers, returning to Japan for equipment.

Nor is Japan fully open to direct foreign investment. Though Japan is an increasingly prolific foreign investor, it has not permitted comparable foreign ownership of its domestic economy. Restrictions on takeovers, while serving the important domestic purpose of maintaining social peace and order, are still enormous barriers to foreign investment. Though direct investment into Japan has increased substantially over the past decade, by the late 1980s foreign direct investment in manufacturing accounted for less than 1 percent of Japanese manufacturing sales, employment, and assets.117 The comparable figures for the United States and Germany were 7-10 percent and 13-18 percent, respectively. Finally, as Section II argued, although technology and advanced

know-how flow easily from the rest of the world into Japan, they do not yet flow as easily out of Japan, except as embodied in Japanese product exports.

The asymmetry of access to technology, markets and investment opportunities is substantial whatever the mix of causes--policy, market structure, business practice, or consumer preference. Asymmetrical access maintains a strategic advantage that guarantees Japan far more autonomy in development and a sound capacity to respond to external constraints. Foreign firms enter licensing arrangements they would not consider either in the American or European market. Where once the government forced technology licensing (and foreigners accepted it because they perceived Japan as weak), now financial muscle and market strength ensure a flow of foreign technology into Japan. The insulated domestic market permits firms to compete intensely among themselves, honing product and processes, and then pour exports onto foreign markets. Other countries are then forced to absorb the excess capacity that Japan's market-share strategies generate. These two strategies, asymmetrical access and overbuilding of capacity, and asymmetrical access result (as, for example, in semiconductor technology) in Japanese developments' precluding or slowing the commercial development of the technology by foreign producers. This strategic advantage can be demonstrated both in particular sectors and across industries.

Japan's relative autonomy and capacities are further enhanced by the emerging economic architecture of the broader Asian region. As argued earlier, Japan is at the core of a region of vibrant and rapidly expanding countries. Networks of excellent production capabilities exist throughout the region, attracting producers from outside to relocate in Asia--not, as before, because the shop-floor workforce is cheaper, but because the workforce is better trained and the engineers are cheap. Once production is transplanted, new product and technology development tends to follow.118

In sum, for the last half-century Japan has acted self-consciously to build its industrial and technological foundation. It continues to act to balance external weakness with internal action. Now a production core essentially independent of American technology and know-how (though tied for the moment to American markets) is emerging in Asia. As Asian incomes rise, a growing Asian market may further disconnect Asian growth from its tie to the U.S. market. Emerging understanding and emulation of Japan's success guarantee that Japanese innovations in policy and corporate strategy--and eventually in manufacturing as well--will spread throughout the region. The prospect for Japan and the rest of Asia is for increasing autonomy conjoined with real capacities to handle constraints arising from outside the region.

The European Region

The indicators of growing Asian regionalism find a counterpart in Europe. In Europe, though, there is an overt political as well as economic dimension to the story. We examine Europe's evaluation in greater detail in Chapter 3. Economic and political challenges have pushed the national powers of Europe to consolidate their markets and their influence. The movement to create a single European market is driven not only by the emergence of Asia, but by the perceived real decline of the United States as a source of technology, production know-how, and hegemonic influence. European elites are rethinking their roles and interests in the world, reconsidering their relations with the United States and within the European Community.

For the last two generations, Europe's economic position has rested on a set of implicit bargains with the United States in technology, finance, and trade built inside of the explicit security bargains.119 In technology, Europe could not lead but it could still acquire it relatively easily from the United States. Though Europe trailed in development, it excelled at applying advanced technology. Its position of privileged second may have grated a bit and did induce efforts to build capable national champions, but it was tolerable and did not provoke united European action. In finance, the dollar anchored the

international financial system. That provided privileges to the United States, but stability for others and, at least until 1971, the right to devalue against the dollar to maintain trade equilibrium. Thus, if Europe could not structure financial rules to its liking, it could at least adjust to American positions. In trade, the United States maintained an open market and encouraged the creation of the Community.

In technology, finance, and trade, in sum, if Europe was not first, it was second, and individual bargains by and between European governments and companies sufficed to generate economic growth and significant geopolitical influence. Over the past fifteen years, however, that situation changed dramatically. Japan's rise and America's decline meant that Europe's position would become even more constrained: Suddenly Europe has to stomach the prospect of being third. Crucial technologies now often appear to be available only from Japan; Tokyo and Bonn as much as Washington shape financial evolution; and in trade, American legislation and bilateral arrangements threaten to disadvantage European industry, while the Japanese market remains relatively impermeable.

Set aside arguments about culture or history. America and Europe share a security structure, but Europe and Japan do not. For the Europeans, to be even modestly dependent on Japan in finance, trade, or technology--is unacceptable without the integrated defense and economic ties that link the Atlantic partners. Asymmetrical access in technology, investment, and trade without integrated security ties makes exchanging a hegemonic America for a hegemonic Japan wholly unattractive.

With the retreat of Soviet power from Eastern Europe and the reunification of Germany, an abrupt reorganization of Europe has confronted the ongoing EEC process. Although these political developments initially risked splintering an emerging Europe back into squabbling national powers, they now appear to have generated an increased commitment to the European project. The clear evidence of that increased commitment can be found in the agreement to pursue European monetary union, which almost certainly will reinforce German economic leadership, increased political union, and the effort of the European Free Trade Association (EFTA) members to negotiate increased accommodation. At least some of the reasons seem evident. A reunited and increasingly powerful Germany can be safely anchored only in a strengthened European community. NATO always provided two containments, an overt containment of the Soviet Union and an implicit containment of Germany. The EEC was founded in part to serve as an anchor for Germany in the West. Now as NATO recedes in political significance, the Community's economic and political bargains may be recast to ensure that a reunited and sovereign Germany remains an integral part of Europe.

On the economic front, Europe already exists as a relatively self-contained unit. Rather than the image of a set of small and medium-sized countries increasingly open to the global economy, Europe should be seen as nations (including the EFTA countries) that have successfully moved from interlinked national economies to an integrated regional economy. Trade within the EEC has grown faster than the trade between the Community and the rest of the world since the establishment of the European Community in 1958. From 1967 to 1987, the ratio of EEC-EEC exports to EEC-non-EEC exports rose from .79 to 1.15.120 Moreover, intra-EEC trade has been a dominant proportion of each member nation's trade. Discounting intra-European trade, Europe's percentage of world exports and imports drops dramatically: exports from 44.6 percent to 13.8 percent and imports from 42.6 percent to 11 percent.121 Add the EFTA-EEC trade and the picture becomes even clearer. In 1967, intra-European trade accounted for 50-60 percent of Europe's total trade; by 1987, the intra-European trade accounted for 60-75 percent.122

These trends are likely to continue with the creation of the Single Market and the adherence of the EFTA countries to it whether they formally join or not. As in Asia, financial ties now also reinforce regional trade ties. The European currencies are increasingly bound to each other through the formal mechanism of the EMS and the

predominance of the D-mark. The EMS mechanism encourages regional integrity by providing greater stability for each national currency. Progress is also being made toward formal coordination of fiscal and monetary policy, which could eventually culminate in a European Central Bank. Even the British, initially so recalcitrant under Margaret Thatcher, are now committing to increased monetary integration.

Europe's regional capacities and fundamental strengths have often 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. Europe's overall industrial position is strong despite the years of supposed sclerosis. Industrial strength is reflected in traditional and scale manufacturing--from textiles to chemicals--and in manufacturing equipment and materials. In these industries, European firms have been very effective, often at the forefront, in applying advanced technology to hold market position--much more successful than their U.S. counterparts. And new strengths have been added to this older foundation. Those include the continuing 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.

The most obvious weaknesses of the postwar years are now being confronted (e.g., the failure to be competitive in the range of the advanced electronic products from semiconductors to computers). Some of the programs, such as those in telecommunications, are likely to succeed; others face real difficulty. But through a variety of mechanisms ranging from subsidies to management of direct investment, the Europeans are attempting to maintain, and in some cases rebuild, essential capacities. This is particularly true in electronics, where a combination of changes in trade rules (e.g., rules of origin shift from assembly to fabrication in the chip industry) and novel enforcement (e.g., tying of dumping to local content) amounts to an explicit policy to force foreign direct investment to rebuild the local electronics supply base. The subsidies flowing into electronics and information technology are enormous (e.g., $3-$4 billion ECU just for semiconductors). The first round of community programs that focused on direct support for procedures are being reconsidered. The latest conceptions and language emphasize market forces and leading-edge users as a means of promoting advantage. This rethinking probably presages a shift in the emphasis of technology development programs and perhaps of trade policy to favor the needs of users over producers. But while the tactics and perhaps strategy may change, the objective remains firm.123

Europe is by no means a single political actor. It will remain a set of national, political communities, and as a region, a bargain among governments. Nonetheless, in a growing number of domains, including trade and, increasingly, finance and technology, European governments are able to act jointly to create regional capabilities. In a world of autonomous regions, Europe would have significant advantages--not least collective wealth, size, education, and political will. Will distinct European security interests emerge? Will Europe as a community pursue a distinct international strategy? There is a growing conviction that Europe can reestablish itself as a leading global player, building capacity for independent action while minimizing perceived vulnerability and dependence on the choices of those in other regions. Like Japan and the rest of Asia, Europe appears to have both an industrial/technological base capable of providing for itself and the political will to maintain that capacity and respond to external constraints. How should the United States react to these developments?

V. Converting Economic Power into Political Influence: Toward the Next Security System

A new distribution of economic resources, of industrial and technological capacities, alters, almost by definition, the constraints and choices for the major nations. Section 1 explored U.S. decline and the development of nascent dependencies in important areas of

trade, finance, and technology. Section II situated U.S. decline as the counterpart of new and powerful industrial capabilities emerging abroad, especially in Asia. Section III suggested that those capabilities were shaping a new technology development trajectory with real implications for security--a new technological foundation for security. Section IV explored the emerging regional distribution of industrial and political capabilities, suggesting how an alternative economic foundation for a new security system could be emerging. Do the developments explored in the first four sections point to a manageable multilateral security system with continued U.S. leadership, or to something entirely different and less congenial to U.S. interests?

New resource distributions do not define purposes and interests, let alone alliances and rivalries. Japan's current conception of comprehensive security emphasizes autonomous finance and trade capabilities but includes continued dependence on an American military umbrella. Similarly, Europe is not a unified protagonist in foreign and security affairs (although in finance and trade it is rapidly becoming one). Nonetheless, the retreat of Soviet power from Europe, the Persian Gulf aftermath, and political changes in Asia all leave Europe, Japan, and the United States with different concerns. For example, if major emigration is provoked by upheaval in the Soviet Union and the Gulf, Europe--not the United States or Japan--will be the primary destination. As the security problems shift, become differentiated, and take new forms, visions of security and conceptions of interests will be redefined. Predicting the evolution of the security system is impossible, but we are able to identify several issues.

Military Potential and Security Interests

At the moment, Europe and Japan are regional economic powers that have the industrial and technological capacity to put a strategic military machine in place. Although the machine does not now exist, Europe and Japan can achieve significant political leverage with the potential to move toward autonomous security positions. Their military potential and changed sense of threat may alter what Europe and Japan will pay for security.

The military potential is very substantial. As suggested earlier, Japan has the component and subsystem expertise to put into place almost any military equipment it chooses. It already builds sophisticated weaponry such as tanks and smart missiles, and is developing systems expertise in aerospace. Recall that the FSX was an American alternative to independent Japanese development of a fighter plane. Many Japanese believe that Japan could have built a better plane on its own.124 The increasing electronics content of weapons may well provide Japan an opportunity to quickly establish an advanced weapons position by trading expertise in avionics for expertise in aeronautics.125 Already, Japanese military electronics are more reliable, with longer intervals between service or failure.126 Japanese industry and policymakers are quite aware that they are likely to be able to produce systems less expensively than the United States. In short, the restrained Japanese military position comes from political choice, not industrial or technological constraint.

Europe's situation is quite different. European countries and industry can build varieties of military systems of all types--indeed, too many varieties. Combined and coordinated, Europe would be a formidable military player. Amid conflicts and doubts, there is identifiable, if tentative, evidence--in planning, procurement, and industry consolidation--of increased European commitment to common defense structures. At the moment, each nation within Europe is dependent on the United States for important technologies. In exact complement to Japan Europe is weakest in the underlying component technologies, strongest in systems expertise. Needless to say, Europe-Japan industrial alliances that are emerging could provide a formidable challenge to U.S. leadership in military systems--even if such collaboration arose only as a consequence of joint commercial projects with substantial spin-on technology. Such outright collaboration on military systems does not require a formal alliance structure: When the

FSX deal was negotiated with the United States, Dassault and the French were exploring a similar venture with the Japanese. Like Japan, Europe now acts out of political choice rather than industrial constraint. Regional industrial capabilities in Japan and Europe now make possible the pursuit of autonomously defined security objectives. That these objectives continue to fall in line with traditional U.S. interests is now mostly a matter of political choice.

Just as important, as Francois Heisbourg argues, the postwar security structure was defense-oriented, clear-cut, comprehensive, and rigid.127 In the new system, confusion and complexity will prevail, defense will lose its centrality, and the nature of threat will become ambiguous. Consequently, Europe and Japan may not need fully autonomous military capabilities to assert and defend autonomous security positions. They may achieve significant political leverage with their mere potential. The circumstances that would spark a reformulation of Japanese or European policy are diverse and could become compelling. The push could come from conflicts and civil wars, likely with the disintegration and reorganization of Central Europe. Or it might start with the Gulf War's cost and consequences. The European discussion of a common defense policy has already begun. It is a discussion in which the place of America is by no means clear.

Europe and Japan have sufficient military, industrial, and political capability to alter the security structure. A situation in which U.S. leadership and managed multilateral security continue because our allies choose not to define an alternative is radically different from one in which U.S. leadership is produced by strength. That situation persists at a time when the rapid changes in Eastern Europe and the Persian Gulf will almost certainly force a redefinition of the relations between the advanced countries, whether or not that redefinition begins within existing alliance institutions. The character of any new security system will depend on the distribution of capacities and the perception of threat, on the balance of external constraints, and on the opportunities perceived in each region. From these will emerge the alliances of the next security system.

Constraint, Influence, and Competition

Constraint and Influence: Economic and technological dominance has been the foundation of American leadership. As we argued earlier, the ability to generate and apply economic resources to the direct exercise of power, or to shape indirectly the international system and its norms, has always been the economic foundation of national security. When allied nation-states are knit together into a shared security system, power within the alliance resides with the nation that has the ability to get the others to act on its behalf or the wherewithal to put to its own use resources belonging to the other states. That can be accomplished directly through overt threat and punishment (or promise and reward), or indirectly when the structure of the system channels particular outcomes that serve the lead state's interests, or when the lead state's preferences become the alliance's accepted norms.128 In the postwar era, industrial and technological resources supported U.S. military strength and underwrote the use of commercial and technical assistance to secure allied agreement with U.S. goals. But the economic dimension was just as critical, indirectly, in its impact on the system's structure and norms. Now, from a position of dominance, America has begun to risk dependence in industry, finance, and critical segments of technology. It seems to us that the situation is now reversed: American influence has not just diminished; rather, we now risk--and the emphasis is on risk--dependence in technology, economy, and finance.

There is little point in speculating on specific instances of future foreign influence and leverage over U.S. decision making. That would require specifying the circumstances in which such leverage would be used. Rather, it is useful to identify some categories where America once exerted influence but now risks dependence. Consider finance: During the 1956 Suez Crisis the United States threatened a run on the pound to constrain British,

French, Israeli action. Now Japan has the financial capacity--and begins, in public, to threaten to use that capacity--to influence the American exchange rate and monetary conditions. Or compare the enormous influence the Marshall Plan permitted the United States after World War II with our relative financial inability to invest in developments in Central Europe today. To stretch the point, but perhaps not so far, note the American use of International Monetary Fund (IMF) conditionality as an instrument to shape domestic choices abroad--even in England. Then note that a single European currency might well make the EC the largest bloc at the IMF, and, perhaps, as some EEC officials gleefully note, move the IMF out of Washington, not just out of American dominant influence.

Similarly, industrial position and financial aid have been significant levers of American influence. Moreover, the success of the American industrial model as one to be imitated reinforced U.S. preeminence. Now Japan dominates the Asian economic region. European market position in electronics and autos has suddenly made Japan and Japanese companies players in Europe. The Japanese "lean" production model calls for emulation; the American system suddenly is depicted as a rigid past.

Finally, as argued here at length, there is technology. America has often shaped decisions of other nations by denying or threatening to deny them access to technology. Why should we expect our experience of technological dependence to be different? And dependent we are in critical electronics and production equipment technologies.

With a reduced military threat, the security problem takes new form. The question of how to achieve security must be redefined. Traditionally, control and use of resources required armed force. Now resources can be controlled through markets. The security issues do not disappear, but they are submerged and hidden by market and social relations. Market structure and functioning must become a matter of direct security concern. The forms it may take will be diverse.

Competition: In a world of competing regional economies, a series of economic relations may be defined and perceived as threatening the ability to preserve the community within a particular territory from outside intervention and control. In that case we would expect nations, or regional governments, to act in economic arenas in ways reminiscent of their security strategies. The stakes may well be the relative course or trajectory of economic development. Whether one country can act to shape another country's trajectory of development is critical to determining whether foreign actions will be seen as security threats or simply irritants on the trade front. We return to this problem in Chapter 6.

There is an emerging intellectual basis for interpreting the particular trade, technology, and investment frictions among competing regions or nations as security threats. A multipolar security system built around a world of mercantilistic competition can be conceived, and justified from increasingly established reasoning. Two analytic frames are necessary--the technology trajectory arguments developed earlier and so-called new-trade theory.

The new-trade theory argues that in oligopolistic industries governments can reshape the structure of global competition and global industry to the benefit of national welfare.129 National gains can occur under two conditions. First, imperfectly competitive industries (e.g., characterized by oligopoly) tend to earn higher returns (excess profits or rents) than those available in other sectors of the economy (where competition bids away excessive returns). Policies that help to win larger market shares for domestic producers in these industries will increase national welfare at the expense of other countries by capturing a larger share of the global profit pie. Second, and more important, certain industries generate external economies (i.e., social gains far in excess of capturable private returns). Government policies to promote or protect these industries can improve welfare by fostering and capturing these spillages. High-technology industries are likely to fall into this class because of the broad knowledge generated by their R&D, and because of the price/performance improvements they create in the industries that apply them. Since most major industrial sectors consist of a limited

number of large powerful firms (oligopoly) and since high technology increasingly occupies center stage in trade disputes, the new-trade theory really addresses the core of industrial competition among the advanced countries.

If we marry the implications of the new trade theory to those of the technology trajectory arguments developed earlier, the result is explosive. Then, the outcome of strategic trade conflicts is not simply a matter of one-time gains or losses that result when one government's policies assist its firms to gain share in global markets to the disadvantage of its trading partners. National position for particular firms in their markets is not the only issue; nor is the current position of one nation in the international economy its final reward. At stake are future gains and losses in terms of each nation's dynamic potential for long-term growth, increased standards of living, and technological preeminence. Trade and domestic technology strategies quickly become the stakes in international conflict.

The more these theoretical arguments are accepted, the greater the perceived stakes in individual trade disputes that influence technology development. This is not simply an intellectual puzzle. The new theories and their marriage simply express or give foundation to an intuition that is, in any case, driving policies abroad. Our concern is that trade debates will be seen as direct security issues. The risk is that the language of security conflicts will be recycled for trade debates.

There are few useful guides for exploring these new security issues. The real difficulty is not which problems existing theories treat or how, but what they do not effectively address. 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 nation to another. The studies in international political economy that consider the interplay of state and development focus on the emerging countries, not the advanced countries.130 Their insights about the ties between domestic development and the international structure are only indirectly integrated into core debates about the dynamics of the advanced industrial democracies. Indeed, the International Political-Economy debate about the advanced countries has presented a problem to comparative politics: how to use national-level variables to account for variations in national economic responses to common international economic problems.

Economics as a Security Problem: The issues raised in this chapter 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. What matters is not simply order, but order on what terms. Nor is it simply a matter of which nations are makers of or takers from the system. The question is: how do dominant powers use their influence in shaping the rules of play to gain advantages in the trade and financial system. In a world of nation-states, it matters what is produced, by whom, and where. The national production profile represents both a set of economic possibilities and security conditions. A nation rich from oil, timber, and agricultural exports has vastly different potential for economic growth and vastly different security constraints than those of a nation wealthy from production of computers, advanced components, and new materials.

Industrial structure and the dynamics of technological evolution have become necessary intellectual foundations for the student of international politics. Success in trade is not simply an alternative to a security strategy.131 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, as Japan's emerging military potential suggests.132 The international political economy debates 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 political economy in military and security policy.

The Next Security Era

Although a new security era is upon us, the current security debate is still rooted in the past.133 It has been 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 because they are dependent on U.S. action for their own security. The new reality confronts us in pieces--in fragments and isolated controversies, not, yet, as a whole. The 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. The reality is that the possibility of American dependence on our allies in a range of significant policy arenas is growing. Whether they use their capabilities to pursue their foreign policy preferences is increasingly a matter of their political choice.

The U.S. economy is no longer so disproportionately large or so distinctively structured around advanced production and technology as to create a fundamental foreign policy advantage. The domains in which the United States used to exert influence to extract security compliance--trade, technology, finance--can no longer rescue American autonomy. Those former domains of action have become binding constraints in their own right. Industrial innovation is no longer the preserve of the United States. The areas of significant industrial weakness are extensive and growing. 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.

Nor, as we have emphasized throughout, will U.S. security preeminence be maintained by current military systems advantages or a new focus on rebuilding the defense industrial base. The dominant U.S. model of military technology developed through military spending faces a less costly, more reliable, more responsive commercial alternative. The architecture of the domestic supply base is consequently shifting from autonomy to dependence on regions whose political interests may diverge from those of the United States. If present developments go unchecked, thorough-going dependence on foreign sources of military components and subsystems will become a reality. The possibility is real that technologies only obtainable abroad will be sufficiently critical to provide leverage on American foreign policy.

The bipolar era is ending. The configuration of the international system is changing. The United States is now confronted with the problem of managing relations with two other, roughly equal regions, each with the capability of acting autonomously in matters of technology, industry, finance, and security. At minimum, the formation of western security policy will become more complicated. Real differences about the organization of the international economic system, as well as the risks and potentials in the remarkable events in Eastern Europe, could become the basis for serious divisions. Allies increasingly will have to be accommodated, even given primacy. At a maximum, badly diverging interests could create the basis of real conflict between the regions.

The nature of threats to the U.S. position in this multipolar world must also be reconsidered. In the world we are describing, the continued erosion of America's international economic position is a national security issue. We are past the point where America's security dominance can be exploited to impose more favorable terms of trade. Rather, we are confronted with precisely the reverse: how others can exploit terms of trade to impose dominance, how they can structure and play the international system through economic means. In that world, the only secure America is a competitively able one. The United States must regain its competitive standing in trade, technology, and finance if it wants to be in a credible position to effectively manage the changing security system.

Think what the Persian Gulf war might have been like if our adversaries had had the technologically advanced planes, night warfare capabilities, and smart weapons. Think of the military systems a combination of Japanese componentry and manufacturing skills with European systems integration know-how might produce. Then think of the emergence of autonomous regions with the political will and capability of pursuing

interests that diverge from a competitively weakened United States. These flights of fancy are increasingly possible. America needs to act not from the belief that we are and can remain dominant, but from an understanding of how we can be effective in circumstances in which we no longer are.