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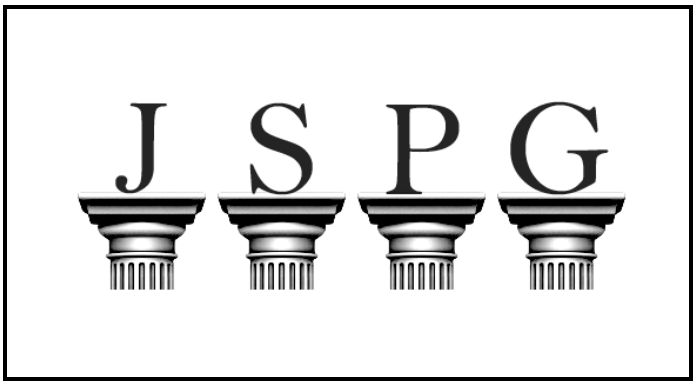

POLICY ANALYSIS:

DÉJÀ VU POLICY: IMPORTING U.S. INNOVATION POLICIES FROM ABROAD

BY

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Executive Summary

The history of United States innovation policy is a combination of military necessity and civilian opportunism. Innovation by necessity stemmed from World War II when the immediate threat from superior Axis weapon systems forced close collaboration between government, academia and industry. Opportunistic innovation stemmed from the ensuing economic boom in which cheap imported energy and expensive exported goods fueled consumption.

Domestic opportunists such as government funded academics and industrial magnates used the Cold War to perpetuate consumption in both military and civilian sectors with diminishing effectiveness and efficiency. In contrast, the international community instituted innovation policies in order to compete in the global economy. The Asian Tigers and the Brazil-Russia-India-China (BRIC) economies are current examples. It is these forces that are the current threats to American supremacy: socio-economic, not military.

In this context, *déjà vu policy* means returning to policies that had previously demonstrated success and that have been subsequently applied by other nations with equal success. Ideological barriers to reform of the current innovation system, such as entrenched political benefits, exist, yet can be overridden by evidence of these programs' success.

This paper argues that U.S. innovation policy stands to benefit most in the short-term if the nation's past policies are re-appropriated. Specifically, we recommend the United States should embrace the most effective elements of military necessity and abandon the least efficient aspects of civilian opportunism. A Four-Point Plan is suggested:

1) Adopt the triple-helix model with industry establishing requirements for invention, academia generating requirement-driven discoveries, and government providing infrastructure and resources;

2) Apply the military innovation model to the civilian sphere in areas of critical social and economic value;

3) Modify educational systems to incentivize and promote applied science and technology fields;

4) Leverage regional links in region's area of technical expertise to advance science, technology, and industry.

Key Words: innovation policy, science and technology, United States, Asian Tigers, policy implementation

Introduction

The United States finds itself facing substantial challenges to its position in the world today. Many of the obstacles that currently impede the nation in this area stem from the United States' continued reliance on domestic and foreign policies that took root during WWII and the Cold War.

These policies evolved during a time when the United States had sufficient economic and political muscle to adequately supply both international military power and domestic consumer goods –also known as *guns and butter* (Gowan, 2004). However the domestic and international environment/landscape has changed since the Cold War.

U.S. strategies, as they regard domestic spending and international relations have become increasingly ineffective in light of the modern geopolitical situation, whereby large countries frequently find themselves at odds with non-state actors and organizations, as opposed to

fighting one another. Likewise, economic globalization has become more profitable and advantageous for states over unilateral economic development (Gulick, 2004). The consequence is a lapse in the development of the American domestic economy.

The actions supported by the *guns*-policy to sustain sole superpower status have now created military capability exceeding any extant threat, supported by a system of innovation and knowledge transfer that has created notable progress. However, this has proven to be a poor formula for contemporary asymmetric warfare. Similarly, the actions supported by the butter-policy to sustain the flow of inexpensive domestic goods have led to a legacy of imbalanced trade and energy dependence that supports a consumptive domestic economy. The result is that, economically, the nation is at a notable disadvantage in terms of its international competitiveness. Thus, it can be seen that the principles that positioned the U.S. as a global power during World War II and beyond now lack efficiency in the modern geopolitical sphere (Gulick, 2004).

Meanwhile, as the Cold War peaked and ended, other nations had begun re-thinking the balance between *guns and butter* policies in ways that would vault them to the positions of economic power they hold today (Wade, 1990). The civilian sectors in democratic Asia followed the American example of military technology innovation, with government funding and synergy between academia and industry. These states, most importantly the nations of Japan, Singapore, the Republic of Korea (South Korea), and the Republic of China (Taiwan), along with the city of Hong Kong, adopted an amalgam of policies and methods of the United States and others deemed most beneficial. Their governments publicly served as ideological allies to the United

States in order to leverage U.S. financial support. Meanwhile, these nations' industries competed economically with their newfound benefactor by leveraging the United States' investment in the advance of science and technology (Stiglitz, 1996). Ironically, this combination enabled them to rival the United States as leaders in technological innovation and production (Gulick, 2004).

The United States diminished its domestic wealth by engaging in costly international conflicts, thus depleting the amount of capital that could have been allocated to internal affairs. Similarly, it increased international wealth by exporting manufacturing capabilities. If the United States hopes to retain its stature, prestige, and power into the 21st century, we argue that it ought to act promptly. Specifically, it should implement policies that have fostered technological and knowledge-based progress internationally much as the international community once leveraged U.S. models for application of expertise and resources to gain a comparative advantage (Gulick, 2004).

The first section of this paper will discuss domestic reforms and the reasons to implement them, using the policies of Asian Tigers for economic growth and development as examples. The second section of this paper will argue that the United States should implement policies and practices that it established during World War II for military purposes and which should now be implemented for civilian purposes.

The Asian Tigers as Models of Domestic Policy

This paper argues that the United States should implement a Four-Point Plan in order to make its domestic innovation policies more efficient. This Four-Point Plan includes:

1. Greater integration of the 'triple helix' of government, industry, and academia, with industry establishing requirements for innovation, academia generating requirement-driven discoveries, and government providing the resources and coordination. (Further explanation of the 'triple helix' is provided later in the paper.)

2. Application of the U.S. military innovation model to the civilian sphere. The military innovation model refers to the method, used by the U.S. military, which has developed and produced new technologies through government coordination of industrial and academic actors to create a product. Currently, government monies, in the forms of grants and research contracts are targeted toward research initiatives that may lack sufficient focus to solve specific problems.

3. Modification of educational systems to provide more support for specialization in applied science and technology fields. Specifically, if a society needs engineering solutions, that society's citizens require strong foundations in math and science. Currently U.S. students lag behind students in Asian Tiger countries in these subjects, which is counter-productive to increasing U.S. technological output and innovation (Human Development Index, 2009).

4. Use of regional links in order to advance technological and related knowledge. Rather than acting individually, countries can utilize one another's knowledge-base and industries to achieve

mutual benefit. This can lead to greater technological innovation and advancement for more countries, and thus benefit a whole region, as has been seen throughout history.

According to Paldam (2002), the Asian Tigers have experienced significant economic growth utilizing this Four-Point Plan in the years following the Second World War. The Asian Tigers are similar to one another in that they have consistently leaned toward Western and democratic institutional development and stable governments. The economies of these nations are based on the production and exportation of high-technology intensive goods (Paldam, 2002). Despite the origination of the Asian Tigers-method of economic development in Japan, geographical and political differences resulted in Asian Tiger states creating comparable styles of said development (Kwon, 2009). Those styles are described below.

A. Intranational-style: This is also referred to as "Japanese-style" (Chu, 1989). In this style, led by Japan and adopted by South Korea and Taiwan, the government uses its power to actively promote collaboration between industry and academia within the country. This extends to large national corporations (e.g., the *keiretsu* in Japan, the *chaebols* in South Korea) that manufacture and export goods. The government supports these corporations with the expectation that their endeavors will benefit the domestic economy (Lee et al., 2008). These corporations are similar in that they serve as decentralized, privately owned and operated businesses. This method of economic governance is primarily intra-national with corporations and academia focused on benefiting the nation economically.

B. International-style: This is also referred to as "City-State style" (Chu, 1989). Followed by Hong Kong and Singapore, this method orients these cities to be centers of global trade. This is

done with a combination of a highly educated population and the promotion of productive and strategically-located facilities for businesses and technology-based development (Huff, 2000). Another notable effect is the existence of extremely transparent capitalism, or capitalism with little internal graft and corruption. In 2009, Transparency International ranked Singapore as the third-most "transparent" national entity today and Hong Kong the eleventh (Transparency International, 2009). The results of this transparent capitalism are increased foreign direct investment (FDI), which is lacking in countries that are significantly less transparent, and generally more corrupt. For example, Hong Kong and Singapore were named as the top freest trade city-states in the world (Lawrence & Hanouz, 2010).

It is from these states, and their methods of economic liberalization guided by government planning and promoted by strong business policies, that the United States can retain its position as the foremost country in terms of technological and economic dominance. Some US states have followed this policy, but as a whole, the country not enacted these policies.

What follows is a detailed examination of the Four-Point Plan.

1. Triple-Helix Orientation

The term "triple helix" was coined by Etzkowitz to represent a system whereby agents of government, industry, and academia interact closely in order to more efficiently produce technological innovations in the modern world. The close connections amongst these sectors allows for greater transfer of knowledge and technology; increasing the likelihood of technology-based innovation. Etzkowitz argues that academia should lead the alliance of the aforementioned agents (Etzkowitz 2003). But global economic stature comes from the success of dominant industries, which are in turn supported by the public and nonprofit sectors, such as government,

academia and research groups. And it is these contrasting facts that lead to different interpretations of the triple-helix orientation.

While the term was coined within the past decade, the concept itself is far older. The U.S. government effectively applied the "triple helix" approach in the 1940s to rapidly advance World War II weapons systems and again to support the Apollo Project in the 1960s.

> World War II was a war that was ultimately won by disruptive advances in technology – the first electronic digital computers, radar, nuclear weapons, among other advances. For the first time, the entire scientific enterprise in the United States—in universities, in industries, in research labs—was mobilized and harnessed to the war effort, developing new technologies for military use. . . The wartime compact between American government and industry, to team in developing new technology to serve the national defense, was sustained into the Cold War that followed. (Nagaoka & Flamm, 2009)

The same approach is embodied in the concept of "National Innovation Systems" (Godin, 2007). For example, in the 1950s and 60s, Japan's government began a series of programs, including the organization of a strong, centralized government and related oversight agencies, that managed industrial focus, as well as provided active support for corporate-university interaction, which became accepted across East Asia (Kwon, 2009). The results of these reforms are apparent, as Japan, a nation completely devastated by World War II, is among the world's top-five-largest economies.

Cross-sector integration offers advantages for innovation (Hartley 2005). Closer integration between the institutions in the triple helix could help promotion of academia and industry to work in unison to more ably address societal needs. Cross-sector integration carries some costs, such as increased accountability for government programs, less autonomy for participating academics, and less proprietary secrecy for participating corporations. However, the cost of such reforms can increase US productivity in these fields, and have the potential to open whole new markets to American economic control.

Despite historical precedent, some people remain firmly against the idea of government-led industry-academia relations, in particular, when academe is not free to set the tone of scientific progress. Etzkowitz argued that *academia* should lead the triple-helix as the source of basic scientific knowledge and those most able to adjudicate its implementation most objectively (Etzkowitz, 2003). This position seems based on advocacy rather than objectivity. World War II and the Apollo Projects demonstrate that government and academia are able to respectively lead and support industry's ability to generate value through the production, distribution, and sale of goods and services in the marketplace, because the public (government) and academic sectors, the for-profit sector (industry) assumes the risk of extinction in exchange for the reward of prosperity. Similarly, the success of an industry is related to its availability and use by customers. As such, industry is dependent on the technological innovations that the triple-helix fosters. This competitive mandate alone qualifies industry to lead technology-based innovations for social and economic benefit.

The United States has fallen behind in both innovative technologies and manufacturing (Bernard et. al 2005). If the United States wishes to compete in these areas globally, it must renovate its economic model to accommodate the new globalizing world. Increased interaction among all three sectors constituting the "triple helix" has the potential to increase innovation to address domestic social and economic priorities – such as energy security and accommodating an aging demographic. National innovation was most recently measured in the Global Innovation Index, a ranking created by the Boston Consulting Group (BCG) and the National Association of Manufacturers (NAM), which measures factors such as government and education policy, number of patents, and business efficiency (DeVol, Wong, 2010). In a ranking of 110 national regions, four of the top ten are Asian Tigers, and three of those outrank the United States. Additionally, Japan and South Korea, both Asian Tigers, top the lists of patents filed per million population, GDP, and R&D expenditure, as filed in 2007 (Oda, 2009). The Asian Tigers and their promotion of innovation through integration of the "triple helix" show a possible, and certainly favorable, method of modernization for US innovation policy.

2. Application of Military Innovation Model to Civilian Sphere

Current U.S. and European funding policies for civilian technology-based R&D are biased toward the academic, linear model of innovation in which government gives money to academia that spends it on basic research, which, in theory, will progress to industry. However these processes do not factor in measures of efficiency or productivity (van Pottelsberghe, 2008). This weakness in the process means that, while the U.S. leads in conceptual discovery and prototype invention in the fields of electronics and computing, other nations, particularly Asian Tiger nations, are more successful in transferring concepts from laboratory inventions through to

finished, marketable products (Mahbubani 2008). For example, the United States was the origin of many industries, such as the semiconductor industry and biotechnological fields. However, these fields are now being transitioned to countries like Singapore and South Korea, states which were able to capitalize on developments in these industries (Mahbubani 2008). Some US companies, like Sematech for semiconductors, have also succeeded this way, proving that this is an economical viable method of production.

Asian Tiger's innovation policies and the American military innovation policy have followed policies initiated during World War II and continued through the Cold War era. This allowed for more government intervention in the spheres of academia and industry. The U.S. Department of Defense (DOD) leverages its massive $668 billion dollar budget to fund private labs and facilities across the country (Sköns, et al., 2009). The result of this is a military with technology, such as stealth and electronic targeting technology, decades ahead of the rest of the world. The military has never abandoned the results-oriented model, which remains readily applicable to developing global industries, such as biotechnology and nanotechnology, with the potential to cement the United States as the leader in these fields as well.

One model for military-driven innovation is the Defense Advanced Research Projects Agency (DARPA), founded to create revolutionary advances in advanced technologies and systems for the U.S. military, by sponsoring high-risk and high-reward R&D in relevant areas. Its three key characteristics are that: 1) it operates independent of military service R&D organizations; 2) it is based on taking risks on big ideas; 3) it is idea-driven and outcome-oriented. With a staff of about 250 people and a budget of about $3 billion, DARPA has contributed to a wide range of

military and civilian applications, including breakthrough advances in information technologies, sensors and materials (DARPA, 2008).

As fields like "green" energy and biotechnology gain economic value, the United States should institute incentives supporting more small to medium-sized enterprises (SMEs). Although lacking in the internal capacities of large corporations, SMEs are not entrenched in mainstream technologies and therefore pre-disposed to disruptive innovations. (Bower, Christensen 2005) Government's proper role, even in a free market economy, should include supplying the infrastructure and resources related to each emerging field, and encouraging investors to support a wider range of start-ups (Tassey, 2010). Given an infusion of public funding, the SMEs can identify external sources of missing expertise and allocate available funds to sponsor the necessary applied research, as seen in many Small Business Innovation Research, or SBIR, programs. To significantly influence the direction of these new and revolutionary fields, the American government must encourage such companies to form and diversify, such as in the Startup America Partnership, which encourages the growth of new companies by providing resources and support to said companies. Further use of these programs will allow companies to be more productive as technology evolves.

Within the Asian Tigers nations, industries such as semiconductors and biotechnology have benefited from universities that receive unambiguous support from major corporations (Kitagawa, 2004). These corporations have the money to support universities because they are subsidized by the government or incentivized for developing a product that fits a public need identified by the government. For example, the Japanese government offers "challenges" to

companies, both large, like the Japanese *keiretsu*, and small, to create a solution to a given dilemma. To complete these challenges, companies will often work closely with each other and universities in order to achieve the desired goal, and the victorious companies will then spread the financial award, or provide future working opportunity, to the universities (Kitagawa 2009).

The Asian Tigers are the dominant producers of many electronics, with cities like Fukuoka in Japan and Taipei in Taiwan allowing these areas to produce over 95% of their GDP. The Asian Tigers, and Singapore in particular, are also growing powers in the field of biotechnology (Huff, 2000). Singapore's pharmaceutical-industry output grew at an average of 29.3% between 1995 and 2002, increasing in that time to S$8,170.6 million from S$1,339 million. Similarly, Singapore is home to a number of both native and foreign biotechnology and pharmaceutical firms (Finegold, et al., 2004). South Korea's growth and economic potential has been great enough that it has been included in the "Next 11" (N11) nations, a group of nations who are considered "potential economic powerhouses," and is one of two in the N11 with the potential to be a BRIC state, a term that refers to a state which is a prominent emerging market (O'Neill, et al., 2005). This indicates that government-led system of policy implementation is the most practical for economic rejuvenation and renaissance. While it is true that the governments of East Asia were more successful in predicting market tendencies than, for example, Latin American governments, their success therein was heavily dependent on the structures that governed economic development.

3. Science & Technology Education Incentives

United States education policy is another area in need of reform. Within the last decade, American students have tested lower than their foreign equivalents in the fields of math and science (National Academy of Sciences, 2007). This contradicts claims of the United States' 'knowledge-based' economy. Meanwhile, some of the top-testing students in the world are from Asian Tiger nations. The nations of Japan and South Korea have both tested into the Top 10 among OECD (Organization for Economic Co-operation and Development) members in 2000, 2003, and 2006, while the United States only tested 15th in 2000, and tested lower than 20th place in both 2003 and 2006 (World Bank, 2010). This illustrates that current U.S. academic policies are, as of yet, unable to substantially compete on equal footing in fields paramount to developmental science and technological innovation.

The Asian Tigers' education system focuses on extensive testing throughout primary and secondary schooling, providing opportunities for greater academic and professional advancement for students who test well (Morris, 1996). This leads to competition among students. Asian Tiger states' governments and societies have heavily vested their interests in the ability of their universities to produce research and development results. These governments have created government ministries of education that have invested large percentages of their national GDP, over a quarter in the case of South Korea, toward improving educational facilities (Kitagawa, 2009). The results of this system are overwhelming. The UN Education Index places South Korea 9th in the world, Japan 33rd, (the two highest in the Asian continent), and South Korea outpaces much of the OECD (Human Development Index, 2009).

Asian Tigers' universities also orient toward specialization of certain fields, such as biotechnology or mechanical engineering. Many universities, from Taipei to Tokyo, have R&D laboratories built or funded by the corporations they work in close alliance with. In Fukuoka, Japan, the local prefecture has specifically moved universities and business consortia into areas where they can function more efficiently (Kitagawa, 2003). The businesses fund the universities' specialized R&D facilities, and the universities provide trained individuals for the businesses to increase productivity (Kitagawa, 2004). Similarly, the U.S. military utilizes university resources and personnel for its projects, which operate within federal R&D laboratories situated across the country (e.g. DARPA). However, in order to see results similar to that of the Asian Tigers, the United States should encourage corporate investment into American universities for civilian technology-based programs.

4. Regionalism and Strategic Partnerships

The phenomenon of "regionalism," where international resources are combined to benefit a particular region, has shown economic viability in a system that exists aside from the generally accepted multilateralism (Baldwin, 1994). Regional Integration Agreements (RIAs) are motions toward socioeconomic and political unity. Examples of RIAs include the Southern African Development Community (SADC) and the European Union (EU). These agreements show that regionalism can allow nations in heavily divided continents to establish a presence in a collective regional market. This reinforces the point of a globalized world, wherein all countries play some role. Regionalism appears to be undervalued by U.S. policy-makers as a policy approach (Mahbubani, 2008). While in recent years the US has initiated some attempts at regionalist trade and economic policies, such as the "New Silk Road"-initiative, a State Department funded

motion to encourage trade linkage and economic growth in Central and South Asia, the US has done this less for economic and more for geopolitical rationales. Wider acceptance and practice of these policies is necessary in a rapidly globalizing world.

The 2008 financial downturn in the United States, and the consequent effects in other nations, is a recent illustration of the interconnectivity of economies around the world. The loss of manufacturing capabilities in the United States resulted from corporate disincentives to support domestic workers, particularly those laboring under union pay and fringe benefit standards (Sachs, et al. 1994). The United States could instead adopt the Japanese example of maintaining a balance between the placement of manufacturing expertise, capacity and labor inside Japan, and among less advanced nations within the regional sphere. In the last century, the United States' tendency has been to look abroad for economic partnerships while ignoring opportunities for them in its own hemisphere, even in cases where the local economies have been globally powerful. Brazil is gaining momentum as a producer of both raw materials and finished goods, leading to its membership in the BRIC alliance. Mexico, a member of NAFTA, is also one of two members of the N11 that have the potential for BRIC status (O'Neill, et al., 2005). With the rise of Mexico and Brazil as economic powers, regionalism holds a great deal of economic potential in the Western hemisphere.

Regionalism also aids technology innovation and inter-sector transfer. In East Asia, the government of China, together with the Asian Tigers, has created a series of technological hubs in numerous cities (Gaulier, et al., 2007). For example, the Special Economic Zones (SEZs) of China in cities like Shenzen-Guangdong and Huamgdong-Shanghai show what government-

supported technology hubs are capable of. Similarly, in Japan, the hub of semiconductor technology is the city of Fukuoka. This became the basis for the largest and most ambitious example of regionalism as applied to technology transfer. The Fukuoka *Silicon Sea-Belt Project* is now a collection of technological and manufacturing hubs stretching from Bangalore, India to Fukuoka, Japan, and spreading through the major manufacturing and technologically-savvy countries of the region. This regional effort has only existed for a few years, but it has already demonstrated successful regional integration of industrial production and high technology innovation (Kitagawa, 2005). The United States has similarly applied the concept to areas, like Silicon Valley in California or Route 128 in Massachusetts, with equally successful results. However, the US has yet to initiate any sort of transnational technology transfer structure, which would be the next logical, and the most beneficial, step in the progression of technology transfer programs.

Justification of Innovation Policy Reform

The reforms described in the Four-Point Plan are designed to revitalize American manufacturing and innovation. Although policy change is often opposed by various factions with vested interests in the status quo, these changes are necessary to preserve the U.S. position as a world power into the next century, and evidence of past success in both domestic and international arenas are reasons to implement these changes. The justifications for these reforms include the following two points:

1) The United States originally applied similar reforms in times of crisis, such as World War II and the Apollo project, to compete with manufacturing and the technological advances of its opponents.

2) Government must lead such reforms, as only government is structurally empowered to implement the changes necessary to yield socio-economic benefits.

1. The United States Can Repeat Prior Success

Asian Tiger economies and the military innovation system of the United States both trace their procedural systems back to the science policies established during the World Wars, in particular that of the Office of Scientific Research and Development (OSRD) during World War II. Then, as now, the innovation system worked to bring the technological level of the United States up to the level of its adversaries. This was attained by the combination of academia-led discovery with the productive capability of a massive industrial complex, each led by government oversight agencies. These agencies proved incredibly successful during the War, and have continued to be useful based on this model for decades afterwards.

2. Role of Government in Past Success

What sector is best qualified to lead the triple helix? In the Asian Tiger-state of South Korea, government successfully manages innovation policy (Shapiro, 2002). A government is, according to the founding documents of the United States, supposed to provide for the best possible life for its citizenry. Therefore, the government can exist as the vehicle to guide technological innovation for societal benefit. Similarly, the government can apply force to change and innovation that may otherwise be lacking for capital firms (Holmstrom 1989). Despite politically biased objections, the reforms of the Asian Tigers could also lead to the creation of more jobs, particularly in the fields of manufacturing and civil administration, thus offering a path to lift the country out of its current unemployment crisis.

All types of governments should play an active role in leading the Triple Helix. While not having the same government command structure as BRIC members such as China, the United States has a continued history of popular sentiment leading to political implementation, as can be noted in the continued success of several US social policies. Using a modified societal version of the "flying geese" hypothesis (developed by Kaname Akamatsu in the 1930s), which asserts that a movement started at a grassroots level will expand upwards, it is necessary for the institution of new policies to take place at local and sub-national levels in order to assure their success on a national level (Kwon, 2009). The success of this style of policy development has been proven, as seen in the previous section, with numerous historical policies. Using a more orthodox approach to that hypothesis, the U.S. military has continued to use its World War II-era policies to the present day. Just as reforms from Japan spread through Asia, reforms could move from the U.S. military's technology-based innovation approach to the domestic civilian sphere.

Conclusion

The United States managed to provide both *guns and butter* for its people throughout the second half of the 20th century, due to the sheer scale of industrial outputs and trade surplus. As the United States falls farther into foreign debt and its manufacturing base continues to erode, along with most of its innovative creativity, the United States may have to decide between its $660-plus billion military budget (which is by far the largest in the world) and its $46,000 GDP per capita, which places the United States among the highest purchasing powers in the world (Sköns, et al., 2009). These numbers are impressive but unsustainable. American dependence on foreign debt support has become increasingly more apparent. A more effective innovation system, combined with a reinvigorated industrial capacity, could lead to stabilization of domestic

markets, which could then be elements for ending crippling debt cycles and easing the effects of unemployment.

Many of the significant social policy reforms in American history, from the abolition of slavery to the progressive and populist movements of the late 19th and early 20th centuries, have begun at a local level, gradually expanding upwards until reaching the national level. Changes made at the top without ownership at the lower levels, appear to be as ineffective as short-term benefits to one sector, which are expected to eventually benefit other sectors. Top-down reforms accrue benefits to the reformers, just as trickle-down economics or linear innovation accrues benefits to the short-term recipients. These failures to extend benefits beyond the initiators or recipients suggest that substantive changes require consent of the government and the governed. In this case, the vested interest groups, such as tenured academics and politicians seeking to bring home funds to their respective districts, need to see their own benefits subsumed and postponed by the greater good, if such a perception is indeed even possible.

The United States has the potential to overcome and reverse the economic and political downturns in the country over the last decade. American military innovation from World War II to the present has shown the applicable success of a "triple helix" style system, with industry and academia led by government. This kind of successful innovation and production cannot occur in terms of civilian innovation without the use of substantial policy reforms in the fields of manufacturing, governance, and foreign policy.

The establishment of future policy reform is dependent not on completely original innovation, but rather on former U.S. policies, which were successfully adapted and applied abroad. The Asian Tigers successfully apply U.S. policies of wartime efficiency to peacetime economics. These states created a successful and implementable system that allowed for the formation of a successful triple helix. This approach has been rapidly adapted by many other rising economies the world over. With America's preexisting economic and technological advantages, progress in regards to domestic development is not only possible, but likely.

The implementation of economic and social policies is an inevitable part of societal evolution. The recommended changes must occur before the problems become intractable, due to the growing disparity between U.S. and international capabilities. Fortunately, history shows that in times of crisis, societies can act in their collective best interests to overcome obstacles to progress and prosperity. Déjà vu policies merely mean that we can relearn the lessons we taught others during our internal period of societal growth and economic expansion.

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