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THESIS

**THE DILEMMAS OF DEVELOPING AN INDIGENOUS
ADVANCED ARMS INDUSTRY FOR DEVELOPING
COUNTRIES: THE CASE OF INDIA AND CHINA**

by

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December 2006

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INDUSTRY FOR DEVELOPING COUNTRIES: THE CASE OF INDIA AND
CHINA**

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ABSTRACT

This thesis will investigate the feasibility of developing nations' ability to create a wholly indigenous advanced arms industry in the twenty-first century using China and India as case studies. I propose it is not possible for developing nations in the current context of the globalized arms race to build an advanced arms industry because of the high political and economic costs. Diverse competing interests force politicians to make decisions about distribution and usage of resources that will maintain their legitimacy. The hypothesis does not rule out that some domestic advancements may be made in certain sectors, such as nuclear bombs and missiles, because resources may be spent on narrowly defined goals instead of the development of the whole industry. Nor does it rule out that a developing nation cannot have a modern military with advanced weaponry, just that the weapons will not all be wholly domestic. They will obtain advanced weapons through joint development, purchasing, or licensing. Political and economic cost will explain the failure of a wholly indigenous advanced arms industry to fully develop, as well as illustrate the few successes within certain sectors of the industry.

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I. INTRODUCTION

The purpose of the thesis is to investigate the feasibility of developing nations' abilities to create wholly indigenous advanced arms industries in the twenty-first century using China and India as case studies. If any two developing countries have the capabilities to develop wholly indigenous arms industries, they are China and India because of their enormous economic gains in the past two decades. Yet, I propose it is not possible for developing nations in the current context of the globalized arms race to build an advanced arms industry because of the high political and economic costs. The hypothesis does not rule out that some domestic advancements may be made in certain sectors because resources may be spent on narrowly defined goals instead of the development of the whole industry. Nor does it rule out that a developing nation cannot have a modern military with advanced weaponry, just that the weapons will not all be domestically developed. Obtaining advanced weapons through joint development, purchasing, or licensing will be the model of procurement. For China and India, political and economic cost will explain the failure of a wholly indigenous advanced arms industry to fully develop.

Increasingly, when discussing rising powers, India and China are mentioned in the same breath.¹ In recent years, they have illustrated their capacity to become world powers economically and militarily within the current century. Thus, the potential growth in their domestic military production capabilities is important. There is also an increasing amount of literature on the rise of China and India and what its relevance to the United States is. Mainly, the discussion in mainstream media is concerned with their rising economic power.² However, they are also both rising military powers in the global context and determined to modernize their military to be technologically relevant in today's high-tech world.

¹ Peter Wonacott, "India, China Forge Ties, But Old Differences Fester By," *Wall Street Journal*, November 22, 2006, 6.

² *Business Week*, "China and India," August 22-29, 2005, 49-136.; Michael Elliot, "India Awakens," *Time* June 26, 2006, 36-39.; Fareed Zakaria, "India Rising," *Newsweek* March 6, 2006, 32-42.; *The Economist*, "Can India Fly?" 379, no. 8480 (2006): 3-18.

China and India are very different countries politically, yet they share a similar pattern in historic and economic experiences of development. China and India were ravaged by imperialism in the 19th century, adopted planned socialist-style economies in the post-war period, and continue to be the world's first and second most populated countries with high rates of poverty and a wide gap between the rich and poor.

However, politically both have taken different paths. One is the world's largest democracy and the other remains a communist country. Whereas India gained independence through a civil disobedience movement and became a democracy, China fought a civil war and became a communist state in 1949. Economically, they both have followed a similar path. In the process of achieving self-reliance, both have tried to develop an advanced arms industry to produce indigenous advanced weapons and both have, for the most part, failed. While India has had a closer relation with the West's arms industry than China, the greatest foreign influence on both their defense industries is that of the Soviet Union. This influence has both hindered and helped the development of their domestic arms industry. A comparative study of similarities and differences between China and India will help outline what inhibits the creation of fully native advanced arms industries in a developing nation.

A. IMPORTANCE OF STUDY

The importance of the research is to provide new insight into the discussion of India's and China's defense industry, as well as that of other developing nations. Though once lively, the debate on India's arms industry had nearly dried up over the previous decades. With the rise of India as economic power, however, the subject on India is reemerging. China, on the other hand, has always generated a lot of literature because of the perceived threat it poses to the security interests of the United States.

Why is it then that two states that can develop nuclear weapons have failed in their quest to create a wholly indigenous advanced arms indigenous in the past 50 years? The thesis will explore if they face similar systemic problems that prevent the development of a wholly indigenous advanced arms industry. This exploration will further our understanding of what to expect from future developing nations that may become economic giants. Was it lack of resources, dependency on foreign power, or lack of accountability in the government bureaucracy that has failed these two countries? The

answer is “yes” to all of the above, but the responsibility in the failure of each factor above is not equal. I will argue the common theme to focus upon is the political will to use scarce resources for advancement of arms.

In most political settings, diverse competing interests force politicians to make decisions about distribution and usage of resources that will keep them in power. The greater the political capital, the greater the attention and resources an interest group will receive. The political capital of different sectors does not remain static but changes over time. It is not politically feasible for leaders in developing countries to pour all of the nation’s limited resources into an advanced arms industry alone and neglect other sectors that demand these same resources. I view China’s Third Front as such an attempt. Neglecting other areas of the economy and society can lead to political instability, a failed state, or revolution. I propose, for these reasons, it is not possible for developing nations after World War II to build a wholly indigenous advanced arms industry.

One may argue that as countries such as India and China become richer and more technically savvy, they will be able to build up their industry and produce their own fully domestic arms industry over the next 50 years. However, I contend that given the advancements that have already taken place in the arms sector, it is too late for late comers to develop their own wholly indigenous industry. The combination of the revolution in military affairs (RMA), the end of the Cold War, the increase in globalization, the sheer cost of advanced weapons, and the high speed of technological changes has made it nearly impossible for countries in the world to develop advances in weapons alone.³ Although rising as economic powers, China and India will not be able to create a fully indigenous advanced arms industry for these reasons. Joint development will be the only affordable alternative politically and economically. Globally, defense industries are shrinking and consolidating due to the end of the Cold War, and states that once had the capability to produce their own such weapons are now pursuing joint development due to the high cost of today’s advanced weapon systems.⁴

³ Anil R. Pustam, “Gradual Evolution: China and India’s Indigenous Combat Aircraft Programmes Steadily Advance,” *Asia-Pacific Defense Reporter* 32, no. 1 (2006): 28-30.

⁴ Jane’s Defence Weekly, “Post-2000 delays to China’s Arms Goals,” 29, no. 3 (1998): 22.

The joint development of the F-35 Joint Strike fighter between the United States (2003 defense budget \$304.7 billion⁵) and, primarily, the United Kingdom (2003 defense budget \$37.3 billion⁶) is an example that illustrates the high-cost concerns that face even rich countries such as the United States. The F-35, still in development, has an estimated development cost of \$35 billion.⁷ The United States' F-22 Raptor's developmental cost is \$40 billion as of 2004.⁸ Britain is contributing at Level 1, or 10 percent, of the development costs of F-35s. Italy and the Netherlands are considered Level 2 partners with the United States, contributing 5 percent of the development cost. Level 3 partners Denmark, Norway, Canada, Australia, and Turkey, are contributing 1 to 2 percent of the cost. To put the cost in perspective for a developing nation, India's entire defense budget in 2005 was \$22.1 billion or 2.77 percent of their GDP. Of that, the Indian Air Force received \$5 billion with only \$2.7 billion going to procurement.⁹ If India had the technical ability, it would take its entire procurement budget for 14 years to develop the F-22, by which time the F-22 would be nearly obsolete. These facts support my assertion that the development of advanced fifth-generation weapons is at a point where developed nations cannot design and field advanced weapons on their own. This will be especially true for the developing nations not possessing the research and development and manufacturing infrastructure developed nations enjoy.

With help, India and China have made strides in modernizing their militaries. However, neither has been successful in developing a full range of indigenous advanced weapons system. India has a mix of Western and Soviet/Russian aircraft and has licensed production of both. China has licensed production of Soviet/Russian aircraft, and there is no argument that China's indigenous armaments are, in effect, upgraded copies of 1950s'

5 K. Crane, R. Cliff, E. Medeiros, J. Mulvenon, and W. Overholt, "Modernizing China's Military Opportunities and Constraints," RAND Project Air Force (Santa Monica, CA: Rand Corporation 2005), 228, www.rand.org (accessed November 7, 2006)

6 Ibid.

7 Jane's Online Research, "Lockheed Martin F-35 Joint Strike Fighter." <http://www8.janes.com/> (accessed November 21, 2006)

8 Jane's Online Research, "Lockheed Martin (645) F-22 Raptor." <http://www8.janes.com/> (accessed November 21, 2006)

9 Jane's Online Research, "India Defence Spending." <http://www8.janes.com/> (accessed November 25, 2006)

and 1960s' Soviet equipment.¹⁰ Medeiros writes, "While many new types of [advanced weapons] ... have entered service since 1980, for the most part the designs of these new systems have been incremental improvements on earlier designs, which in many cases trace their lineage back to 1950s' Soviet technology."¹¹ Yet there is only so much one can modernize an obsolete weapons system. As this study will show, the weapons that are partially domestic in both countries, particularly China, still require a great deal of outside help for the more technical aspects of development.¹² Although I argue India is further along than China in developing an indigenous capability, the advanced arms industry has reached the point where it is so expensive that China and India can no longer develop a wholly domestic advanced arms industry. Therefore, joint development will be the only path for them to modernize their defense industry, which they are already pursuing in some sectors.

Not having the ability to produce a fully advanced arms industry and seeking the most advanced weapons; both India and China will pursue joint development, but they will take different paths. I envision India will pursue more joint development with the West and the United States instead of Russia. Though Russia is their traditional partner, India has always preferred Western hardware due to the capabilities. Joint ventures with the West will help modernize its arms industry at a faster rate because Western nations are more likely to accept partners for joint development programs.¹³ As a communist state, China will travel a more difficult road. In comparison, India's production capabilities are more technically advanced than China's although they spend less. Western countries will hesitate in doing joint ventures with China's authoritarian regime.

¹⁰ Paul H. B. Godwin, "The PLA faces the Twenty-First Century: Reflections on Technology, Doctrine, Strategy, and Operations," in *China's Military Faces the Future*, ed. James Lilley and David Shambaugh (Armonk, NY: M.E. Sharpe, 1999): 63.; John W. Lewis and Xue Litai, "China's Search for a Modern Air Force," *International Security* 24, no. 1 (1999): 64-94.; Onkar Marwah and Jonathan D. Pollack, eds. *Military Power and Policy in Asian States: China, India, Japan*. (Boulder, CO: Westview Press, 1980)

¹¹ E. Medeiros, R. Cliff, K. Crane, and J. Mulvenon, *A New Direction for China's Defense Industry*, (Santa Monica, CA: Rand Corporation, 2005) 8-9. www.rand.org (accessed November 7, 2006)

¹² Crane, "Modernizing," 246.; Bernard D. Cole and Paul H.B. Godwin, "Advanced Military Technology and the PLA: Priorities and Capabilities for the 21st Century," in *the Chinese Armed Forces in the 21st Century*, ed. Larry M. Wortzel (Carlisle, PA: Strategic Studies Institute, U.S. Army War College 1999): 194.

¹³ Richard Bitzinger, "The Globalization of the Arms Industry: The Next Proliferation Challenge," *International Security* 19, no. 2 (1994): 178.

The Russians are, and will continue to be, the largest supplier of weapons and weapons technology to China. However, even though China's system of government may impede Western nations from working to get a piece of the China market, it will not stop them from selling weapons or components, as demonstrated by Israel, Britain, and other European-Union countries.

Investigating the feasibility of India and China developing an advanced arms industry will provide some important insight into the future of their defense industries as well as those of the rest of the developing world. My research will demonstrate that nations without a fully indigenous arms industry will not be able to acquire one, even through licensing/building other countries' weapons or through joint development. If they continue down the road alone in an attempt to develop a fully native defense production capability, they will fail ending up with expensive obsolete weapons systems. If they continue to license and build upon other countries' weapons, they will not fully develop their own industry, nor will they have cutting-edge weapons. In addition, they remain dependent on or vulnerable to foreign powers. The path less-developed nations will choose and with whom they will pursue development will also have ramifications on the United States' influence in the region, the international community, and balance of power in the region.

B LITERATURE REVIEW

One of China's and India's goals since becoming modern nation-states was self-reliance in the arms industry. Both the nations have worked to create an advanced arms industry, yet their success is limited to their missile and nuclear programs. At first glance, it would seem that two countries that have developed nuclear powers would also have the capability of developing indigenous advanced arms industry. The predominant opinion, however, is that the defense industry in India and China is producing modern

advanced weaponry in certain sectors only.¹⁴ The defense industries in both countries are mostly nationalized and, therefore, heavily influenced by domestic politics. Changes in government, security environment, and the economy are all important factors that determine the kind of support the arms industry receives. These factors influence the leadership's capacity to use the nation's limited resources on the defense sector. Both India's and China's arms industry has ridden the rollercoaster of politics, becoming a priority in times of a perceived threat and taking a back seat when the threat decreases. The problem facing both the countries is that at times of threat, when the defense sector is expected to perform, past indifferences and poor funding hamper their ability to perform and produce.

1. Indian Advanced Arms: A Preview

In the case of India, most research addresses the failings or successes of the weapons systems themselves and devotes little or no attention to the structural reasons for the industry's failures or successes. Very few scholars have attempted an in-depth analysis of India's industry wide domestic production and procurement problems.¹⁵ The bulk of literature focuses on individual projects undertaken by the Indian arms industry, focusing on what has succeeded and what has failed.¹⁶ A number of distinct camps stand out. One camp blames India's failure to develop its own weapons capacity on the dependency on Soviet Union.¹⁷ Others, such as Deba Mohanty, blame the lack of

¹⁴ Adrienne K. Darling, *India Global Ambitions Limited By Reach* (Strategy Research Project, United States Army War College, 1998); June T. Dreyer, *The PLA and the Kosovo Conflict*, (Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, 2000); Paul H.B. Godwin, "From Continent to Periphery: PLA Doctrine, Strategy and Capabilities towards 2000," *China Quarterly* 146, Special Issue: China's Military in Transition, (1996): 464-487.; Amit Gupta, "Determining India's Force Structure and Military Doctrine: I Want My MiG," *Asian Survey* 35, no. 5 (1995): 441-458.; A. Z. Hilali, "India's Strategic Thinking and Its National Security Policy," *Asian Survey* 41, no. 5 (2001): 737-764.; Ellis Joffe, *The Chinese Army after Mao* (Cambridge, Mass: Harvard University Press, 1987); David Shambaugh, "China Engages Asia, Reshaping the Regional Order," *International Security* 29, no. 6 (2004): 64-99. and *Modernizing China's Military: Progress, Problems, and Prospects* (Berkeley CA: University of California Press, 2002)

¹⁵ Amit Gupta, "The Indian Arms Industry: A Lumbering Giant?" *Asian Survey* 30, no. 9 (1990): 846-861.; Chris Smith, *India's Ad Hoc Arsenal: Direction or Drift in Defence Policy?* (Oxford; NY: Oxford University Press, 1994)

¹⁶ Coniglio Sergio and Mohammed Ahmedullah, "Indian Air Force Ponders New Fighter Programme," *Military Technology* 29, no. 2 (2005): 85.; James Clad, "India: Industry," *Far Eastern Economic Review* 148, no. 23 (1990): 47-48.

¹⁷ Gupta, "Lumbering," 846-861.; Ramesh Thakur, "The Impact of the Soviet Collapse on Military Relations With India," *Europe-Asia Studies* 45, no. 5 (1993): 831-850.

sufficient funding and access to modern defense technologies.¹⁸ Still others blame the military's indecision and changing requirements.¹⁹ However, none focus on whether it was possible to develop the industry given the domestic and political constraints in the country and the rapid technological advancements in the world.

2. China's Advanced Arms Development

The literature on China differs from the Indian literature in one very important aspect and that is what its arms advancement means for the United States. There are two debates concerning the rise of China as a military power. The first debate in the literature is whether China is a threat to the United States or not.²⁰ In addition to the rising threat literature, there is also a debate about whether China's military is catching up technologically with the United States military capabilities, which appears to be contradictory given China's inability to modernize its military. Like the threat debate, there is no consensus on China's defense development and modernization. Some say China can modernize its military.²¹ Others say it is impossible to predict more than 10 to 15 years down the road, and the possibility of modernization should not be dismissed outright, as we should not underestimate China.²² There seems to be a greater number who feel that China is not going to catch up with the United States anytime soon with

¹⁸ Deba R. Mohanty, "India's Defence Budget Blinkers," *Military Technology* 29, no. 4 (2005): 6. and "The Long March Toward Self-Reliance," *Military Technology* 27, no. 2 (2003): 35-42.

¹⁹ Smith, *Ad Hoc.*; Mrinal Suman, "Qualitative Requirements of Military Equipment Need For a Process Revamp," Bharat Rakshak, The Consortium of Indian Military Websites. <http://www.bharat-rakshak.com/SRR/Vol12/suman.html> (accessed August 2006)

²⁰ Thomas J. Christensen, "Posing Problems Without Catching Up, China's Rise and Challenges for U.S. Security Policy," *International Security* 25, no 4 (2001): 5-40.; Dreyer, *PLA*. Aaron L. Friedberg, "The Struggle for Mastery in Asia," *Commentary* Nov. 2000, 17-26.; *Jane's Intelligent Review*, "Pentagon Raises eyebrow at China's Military Rise," 18, no 8 (2006): 50-51.; Bates Gill and Michael O'Hanlon, "China's Hollow Military," *The National Interest*, no. 53 (1999): 55-62.; John G. Ikenberry, "American Hegemony and East Asian Order," *Australian Journal of International Affairs* 58, no. 3 (2004): 353-367.; Evan S. Medeiros and M. Taylor Fravel, "China's New Diplomacy," *Foreign Affairs*, Nov. - Dec 2003, 22-35.

²¹ Johnathan D. Pollack, "China as a Military Power," in *Military Power and Policy in Asian States: China, India, Japan*, ed. Onkar Marwah and Jonathan D. Pollack (Boulder, CO: Westview Press, 1980), 43-100.

²² Michael Pillsbury, "PLA Capabilities in the 21st Century: How does China Assess Its Future Security Needs?" in *The Chinese Armed Forces in the 21st Century*, ed. Larry M. Wortzel (Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, 1999), 89-158.

their domestic capabilities and modernization.²³ It is the last school of thought that supports my thesis. China will not be able to develop a fully indigenous arms capability.

Meanwhile, literature that comes from within China is not too controversial. It focuses on how the communist leadership doctrines and policies affect the arms industry and the People's Liberation Army (PLA). However, there appears to be a limited analysis on how China's defense industry fits into the global context. Some Chinese sources, at times, can be critical of government policies, but generally they tend to do it indirectly or focus on weaknesses that must be fixed or addressed. There is an agreement inside and outside China that PLA needs to be modernized.²⁴

However, my thesis does differ in viewpoint from those who argue China cannot modernize. I look at the problem in the larger context of nation building. It is my contention that China's industrialization is not linked to their ability to modernize, but rather that it is linked to their ability to join successful ventures. It was not possible for them to develop a wholly indigenous advanced arms industry after WWII, given the domestic economic and political setting at the time, including the arms developments taking place in the developed countries. That remains the case in the current context. This differs from existing literature regarding political and security influences on industrialization in China. In the authors' investigations, they link the failing to the symptoms, lack of technology, bureaucracy, poor oversight, corruption, bad policy, under funding, and dependency but not to the systemic problem of nation building.²⁵

²³ Cole, "Advanced," 159-215.; Lewis, "Search," 64-94. John G. Roos, "The New Long March, China's Military Modernization Activities Held in Check by Higher-Priority, Economics-Centered Goals," *Armed Forces Journal International* (August 1997): 40-42. Larry M. Wortzel, *China's Military Potential*, (Carlisle Barracks, PA: Strategic Studies Institute: U.S. Army War College, 1998)

²⁴ Liu Huaqing, "Unswervingly Advance Along the Road of Building a Modern Army with Chinese Characteristics," *Qiushi*, no 15 (1993): 1-2. Robert L. Paarlberg, "Knowledge as Power Science, Military Dominance, and US Security," *International Security* 29, no. 1 (2004): 122-151.; Fu Quanyou, "Make Active Explorations, Deepen Reform, Advance Military Work in an All-Round Way," *Beijing Qiushi in Chinese*, no. 6, (1998): 2-6. (FIBIS); Roos, "New," 40-42.

²⁵ David Bachman, "Defense Industrialization in Guangdong," *China Quarterly*, No. 166 (2000): 273-304.; Stephen P. Cohen, *India: Emerging Power* (Washington DC: The Brookings, 2001); Evan A. Feigenbaum, "Soldiers, Weapons and Chinese Development Strategy: The Mao Era Military in China's Economic and Institutional Debate," *China Quarterly*, no. 158 (1999): 285-313.; Lewis, "Search," 64-94.; Barry Naughton, "The Third Front: Defense Industrialization in the Chinese Interior," *China Quarterly*, No. 115 (1991): 351-386.

C. CONCLUSION

My thesis presents a starting point to a discussion on the possibility for developing nations to produce an advanced arms industry with no outside help. There is no doubt that India and China will continue with their overall modernization efforts. However, in most literature there appear to be disagreements on how they will and ought to develop and modernize an arms industry. In general, there are those who discuss the benefits of purchasing weapons, as well as those who believe it is detrimental to rely on other nations.

Before China and India can turn their arms programs around, they need to know what is possible. If an advanced arms industry is not feasible, what path should they follow for development of their industry? What led to the successes in their nuclear and missile programs? As I will show the success of the nuclear and missile programs is based on the presence of high political capital for certain sectors whereas the cost of developing a wholly indigenous advanced arms industry is so high, only small sectors can be justified, given other political and economic priorities.

II. DEVELOPING NATIONS' QUEST FOR AN INDIGENOUS ARMS INDUSTRY

In this chapter, I provide the background to the problems facing developing nations in creating an indigenous arms industry. This chapter will lay the foundation to better understand and evaluate the two cases of China and India in relation to how other nations with advanced arms industry have developed theirs. What are some of the phases of development and what are the impediments they face?

According to Dvir and Tishler, the development of domestic advanced arms industry goes through four phases: (1) producing small arms and ammunition, (2) producing under license, (3) modifying and improving licensed weapons, and finally (4) producing indigenous weapons.²⁶ All nations usually go through the same incremental phases of development, with only some reaching the fourth stage. Different factors influence the political will of leaders of developing nations in determining what stage of development to take their indigenous arms industry. According to Edward Milenky,

Arms production may be undertaken as one of many prestige projects or to satisfy the military's bureaucratic interests. A shortage of foreign exchange, political problems in acquiring foreign equipment, and a general preference for import substitution and a greater degree of national economic and strategic independence may provide more practical reasons.²⁷

According to the literature, 26-28 countries that were not industrialized prior to or during the war have reached the first phase of arms development since World War II.²⁸ While some may produce partially indigenous weapons, none have reached the fourth phase of development. Nations that have reached the domestic production phase are not doing so independently. The third phase is the highest some have achieved (modifying

²⁶ Dov Dvir and Asher Tishler, "The Changing Role of the Defense Industry in Israel's Industrial and Technological Development," in *The Place of the Defense Industry in National Systems of Innovation*, Occasional Paper #25, ed. Judith Reppy (Cornell University: Peace Studies Program, April 2000), 2. <http://www.ciaonet.org/wps/rej03/index.html> (accessed November 9, 2006)

²⁷ Edward S. Milenky, "Arms Production and National Security in Argentina," *Journal of Interamerican Studies and World Affairs* 22, no. 3 (1980): 285-286.; Stephanie G. Neuman, "International Stratification and Third World Military Industries," *International Organization* 38, no. 1 (1984):172.

²⁸ Ibid., 267.

and improving licensed weapons). They either produce copies of older-generation equipment or still require components from developed nations.

Countries in the higher phase that come to mind, besides India and China, are South Korea, South Africa, and Israel. South Korean development can be explained by the fact that they inherited some industrialization from the Japanese in the pre-war era. In addition, the United States pumped a significant amount of money into South Korea's industrialization and weapons development in its fight against communism. Israel, too, has had significant funding from the United States and other developed nations.²⁹ Interestingly, some of the more developed nations do not have a fully domestic advanced arms industry, whereas Israel supposedly has a nuclear weapon. In the case of South Africa, which has developed and relinquished nuclear weapons, a fully indigenous advanced arms industry has yet to emerge.³⁰ Therefore, there are no nations created or liberated in the post-World War II era that can lay claim to having a wholly indigenous advanced arms industry. Stephanie Neuman summarizes, "[my] data show no LDC [less developed nation] as achieving a completely independent R&D and production capability for any major weapons system and its component subsystems."³¹ To emphasize the difficulty facing developing nations in developing its advanced industry, it appears that the number of developed nations that possess a fully domestic advanced arms industry is shrinking due to globalize consolidations and mergers.

Richard Bitzinger categorizes nations with defense industries into three tiers. First-tier countries are developed nations such as the United States, Britain and France who have fully indigenous advanced arms industries. First-tier countries are beyond the fourth phase of development. The second tier which is a larger category includes nations that have reached the second through fourth phases of defense industrial development

²⁹ Farah Naaz, "Israel's Arms Industry," *Strategic Analysis: a Monthly Journal of the IDSA* 23, no. 12 (2000): 5. http://www.ciaonet.org/olj/sa/sa_aug00.html (accessed November 9, 2006)

³⁰ For more on why they gave it up read Maria Babbage, "White Elephants: Why South Africa Gave Up the Bomb and the Implications for Nuclear Nonproliferation Policy," *Journal of Public and International Affairs* 14 (Spring 2004): 1-20.

³¹ Neuman, "Stratification," 177.

yet, are not independent developers.³² Third-tier nations have only reached the first phase of development. According to Bitzinger, “Third-tier states are defined as those possessing very limited and generally low-tech arms-production capabilities; countries in this group would include Egypt, Mexico and Nigeria.”³³

A. POST WORLD WAR II: STARTING FROM SCRATCH

Following World War II, several developing countries that wanted to create an indigenous arms industry also faced a daunting task of creating modern nation-states. From an economic standpoint, the resources they would require for industrialization and modernization were staggering. Not only did these nations, for the most part, have to create an industrial base, but they had to establish a national identity, stable government, infrastructure, bureaucracy to run the country, and educational systems. The choice to develop advanced weapons added to the burden. According to Bitzinger,

Advanced weapons systems involving major original development efforts can require considerable inputs of additional – and generally expensive – resources in the form of scientists, engineers, technicians, equipment, and production technology. At the same time, such technology is highly perishable and must be constantly replenished, demanding still more inputs.³⁴

None of these nations has overcome the hurdles of developing a fully indigenous advanced arms industry while developing a modern state at the same time.

1. The Decision to Develop

Developing nations after World War II needed to choose between buying weapons and developing their own. The argument is similar to that of whether to adopt import substitution model versus foreign direct investment model.³⁵ Neuman argues that only larger nations like India and China had the realistic option of developing an

³² Richard Bitzinger, *Problems and Prospects Facing Second-Tier Arms-Producing States in the Post-Cold War Era: A Comparative Assessment*, (Council on Foreign Relations Working Paper, November 2000), 1. <http://www.ciaonet.org/wps/bir01/bir01.html> (accessed November 9, 2006)

³² Ibid.

³³ Bitzinger, *Problems*, 1.

³⁴ Ibid., 4.

³⁵ Jurgen Brauer, “The Arms Industry in Developing Nations: History and Post-Cold War Assessment,” (paper presented at the conference on Military Expenditures in Developing and Emerging Nations, London, England, March 13-14, 1998), 6.

advanced arms industry because of their size and available resources.³⁶ Those that did decide to develop on their own, according to Bitzinger, did so for many reasons: "...to possess an indigenous and therefore secure source of armaments; to promote industrial and technological development; to save or to make money; and for reasons of pride and prestige."³⁷

Developing countries without an industrial base faced multiple hurdles in creating an advanced arms industry. As a typical chicken-and-egg argument, the question was which to build first; civilian or defense industry, or civilian industrial base and arms industry at the same time? The choice was based on more than just the availability of resources. For example, Israel chose defense first due to the threats it confronted. Sharon Sadeh points out that "Israel's search for qualitative superiority over its neighbors underlined the need for technologically advanced systems. They made more resources available for the defense industries, which became a major component of the Israeli economy."³⁸ For Israel, national defense had greater political capital than other components.

In the current context, developing nations have to decide what level of native defense production capacity they need. Many factors determine the level they strive to reach, but nearly all have some first-phase capacity (small arms and ammunition production). Higher the phase, the more difficult it is to reach. According to analysts such as Milenky and Neuman, getting past the first phase of development is difficult,³⁹ and those that do get past it, get stuck in the second phase.⁴⁰ No matter the level they strive to reach, most developing nations try to build both civilian and defense industries at the same time due to political demands and security threats.

a. Social Tensions and Political Will

To build a defense or civilian industry requires technologies new nations do not have, an infrastructure they have yet to fully develop, and lack capital to build or

³⁶ Neuman, "Stratification," 182.

³⁷ Bitzinger, *Problems*, 2.

³⁸ Sharon Sadeh, "Israel's Beleaguered Defense Industry," *Middle East Review of International Affairs* 5, no. 1 (2001): 4. http://www.ciaonet.org/olj/meria/meria01_sas01.html (accessed November 9, 2006)

³⁹ Milenky, "Arms," 285.

⁴⁰ Neuman, "Stratification," 180.

buy what they do not have. To industrialize, they must spend money on research and development and, where possible, purchase technology. Bitzinger observes that there are "... quite significant start-up costs to arms production, as laboratories and research facilities must be established, factories must be built, machinery purchased, and scientists, technicians and workers trained."⁴¹

Other priorities facing a newly created or independent take up political capital. Bitzinger also writes, "Throughout the developing world, economic shortages and competition over limited resources directly or indirectly cause social tensions."⁴² Tensions increase or decrease the political capital of different sectors. The greater the social crisis, the greater the political capital to resolve it. The question for developing nations' leaders is: do they spread the resources evenly or do they create priorities to maximize limited resources?

b. Security Threat's Influence on Political Will

In addition to social tensions, often a real or perceived security threat or lack thereof will influence how great the political will is to use limited resources on the defense industry. In general, the greater the threat, the greater the political will to spend on defense, and the less the threat, the less the political will. According to Sadeh in Israel, for example, "The Israeli government has allocated many resources, most of them at the expense of other pressing requirements like housing and infrastructure, in order to establish an independent military industrial base"⁴³ because of their very real security threat. For Israel, the political capital for the defense industry was greater than the political capital of housing and infrastructure caused by social tensions. Sometimes the more immediate threat will lead to purchasing rather than development due to the long lead times. In case of China and India, however, I will show the security threat has been intermittent, affecting how much is spent on the defense sector.

⁴¹ Bitzinger, *Problems*, 4.

⁴² Albert Keidel, "China's Social Unrest: The Story Behind the Stories," *Carnegie Endowment for International Peace Policy Brief* 48 (September 2006): 3. www.CarnegieEndowment.org (accessed 21 Sep 06)

⁴³ Sadeh, "Israel's," 2.

c. Power's Influence on Political Will

Political will can also be influenced by patronage, corruption, or fear of losing power and/or influence. In other words, politics will affect political will. The decision to support the defense sector will depend on the government's will to overcome the aspects mentioned above to sabotage it. Budget cuts demonstrate the influence of political capital on a government's choice for cutting costs. Robert Looney and David Winterford describe that "... officials often follow rather ad hoc rules for making large contractions in a short time, cutting new rather than ongoing projects ... and favoring ministries that are politically powerful."⁴⁴ The political capital of older programs is, more often than not, stronger than new programs. Ministries and programs threatened by the cuts, that are politically powerful, use the power to protect themselves, diverting funds from defense.

2. Development Still Requires Purchasing

The decision to use scarce political capital is made more difficult in discussing advanced weapons because developing nations also have to purchase weapons or critical components from developed nations to stay updated. Even second-tier nations that have entered the higher phases of development in the advanced arms industry are still dependent on other nations.⁴⁵ According to Bitzinger,

While these countries have certainly developed a capacity to produce finished weapons systems, they have been unable to eliminate or even substantially reduce their subordination to foreign suppliers. Local arms production continues to rely heavily upon foreign inputs for weapons design, engineering and development assistance, critical components and subsystems, machine tools, and production know-how.⁴⁶

Crane, too, has found the same in his investigation of China's fighter program, which is well-rooted in phase three. It "... has had to rely on imports of planes or key components to obtain aircraft that are even somewhat competitive with those by the

⁴⁴ Robert Looney and David Winterford, *Economic Causes and Consequences of Defense Expenditures in the Middle East and South Asia*, (Boulder, CO: Westview Press, 1995), 102.

⁴⁵ Neuman, "Stratification," 176.; Bitzinger, "Challenge," 177.

⁴⁶ Bitzinger, *Problems*, 2.

United States.”⁴⁷ As these countries try to build their industry, they are still dependant on developed nations. The India and China chapter will demonstrate this in more details.

Purchasing weapons and components from foreign countries drains resources from research and development for building weapons and industrial infrastructure. Current trends show that even the purchasing of weapons needed to stay updated is getting more difficult because of the skyrocketing cost of advanced weapons. Richard Grimmett states,

Various developing nations have reduced their weapons purchase primarily due to their lack of sufficient funds to pay for such weapons. Even those prospective arms purchasers in the developing world with significant assets continue to exercise cautions before embarking on new and costly weapons procurement programs.⁴⁸

Budgets are tight and there is not much money to spend on purchasing, let alone developing their own industry. To make matters more complex, foreign pressure, corruption, and patronage sometimes influence the purchase of weapons that are not the best value for the money.

a. *More Resources Required*

If developing nations choose to create their own advanced arms industry, they will require more resources than developed nations. First, they have to create industries and infrastructure, both civilian and defense, that do not exist. Developed nations already had industry and infrastructure in place before World War II. Therefore, they can focus on upgrading existing infrastructure, building newer or more advanced infrastructure, and/or can put money into other areas such as research and development which is not as expensive. Second, developing nations need to spend more on research and development because they are behind technologically. They have to find a way of educating people on the basics and simultaneously doing advanced research. Developed nations may update weapons by purchasing but that also requires more funds taking away funds from research. Third, since developed nations actually spend more on research and development, developing nations fall further behind. The United States spent 13 percent

⁴⁷ Crane, “Modernizing,” 246.

⁴⁸ Richard F. Grimmett, “Conventional Arms Transfers to Developing Nations, 1997-2004,” *The DISAM Journal of International Security Assistance Management* 28, no. 1 (2005): 45.

or \$69.4 billion of its \$441.8 billion defense budget on R&D in 2006.⁴⁹ India spent 5 percent or \$1.08 billion of its \$23.6 billion defense budget on R&D in 2006.⁵⁰ China data is harder to obtain but according to a Rand report, they spent \$37.6 billion on research and development in 1999, and the United States spent \$244 billion.⁵¹ Fourth, developing nations have to purchase weapons to stay caught up, especially if there are security threats, perceived or real. Fifth, they have to create the institutions and human capital to allow them to create, maintain, and operate the weapons.⁵²

China and India are no different than other developing nations and face the same challenges. Bitzinger found domestic weapons production in developing nations “... is typically geared toward meeting domestic requirements, which in turn usually means small, inefficient production runs and high unit costs. In fact, in many second-tier states it is increasingly difficult to justify arms production from a profit-oriented approach.”⁵³ Even the United States with its wealth and well established defense industry is doing the same with its purchase of the F-22 Raptor. United States’ Air Force leaders have had to continuously justify the cost of the fighter to the Congress.⁵⁴ Budget cuts are forcing the United States Air Force to reduce the total number of aircraft purchased. The research and production cost concentrated in fewer aircraft increase the cost of each fighter.

b. Civilian Development First

Logic would dictate that the less-developed nations develop the civilian side during secure times, get caught up technologically, and then switch gears and transfer that knowledge to the defense industry. However, developing a civilian sector

⁴⁹ Michael Sirak, “US Defence Budget: Air Force Focus on Global Role,” *Jane’s Online Research*. <http://www8.janes.com/> (accessed November 25, 2006)

⁵⁰ *Jane’s “India Defence,”*

⁵¹ Elisa Eiseman, Kei Koizumi, and Donna Fossum, *RAND Monograph Report, Federal Investment in R&D*. (Santa Monica, CA: Rand Corporation, 2004), 50-51. http://www.rand.org/pubs/monograph_reports/MR1639.0/

⁵² Brauer, “Arms,” 5-6.

⁵³ Bitzinger, *Problems*, 3.

⁵⁴ David B. Newman, “The Air Force’s Proposal for Procuring F-22 Fighters,” (testimony before the Subcommittee on Air Land Committee on Armed Services United States Senate July 25, 2006) <http://www.cbo.gov/ftpdocs/74xx/doc7424/07-25-F-22.pdf>. (accessed November 22, 2006); “Tactical Aircraft: DOD Should Present a New F-22A Business Case before Making Further Investments,” GAO report number GAO-06-455R, June 21, 2006.; *Jane’s “Raptor.”*

first to use the civilian-based technology on military equipment does not work as well as it would seem. The China chapter demonstrates the problem. Having a secure environment over the last 50 years to build a civilian economy, while not worrying about national security, is a luxury few nations have been able to enjoy. For those nations that choose to build the civilian sector first, the secure times are not long enough to develop weapons or do the research and development required. Since the real or perceived security environment does not allow for this, nations are forced to purchase weapons to stay competitive militarily.

To emphasize the great lengths of time to develop defense equipment, a study published in *Defense and Peace Economics*⁵⁵ shows there is a tremendous lag time between research and development, fielding of a military system, and the quality of that system. In their study of developed nations, "... investment made 10-25 years beforehand predominantly determines military equipment quality."⁵⁶ If developed nations must invest in military research and development 10 to 25 years in advance, then the task confronting developing nations is daunting. They are already significantly behind technologically, have fewer research-and-development capabilities and fewer resources. This research also supports the notion that, in times of crisis or international tension, money poured into the defense industry will not produce results during the crisis. To add to their problem, the licensed equipment they build in hopes of modernizing their industry is also out of date. According to Neuman, "Military technologies produced by Third World countries under license in 1980 were, on average, designed and developed twenty-two years earlier."⁵⁷ This forces the purchase of weapons to meet the immediate threat diverting scarce resources from their goal, indigenous development.

B. POST COLD WAR: IS IT TOO LATE?

The end of the Cold War unleashed a new era for defense industries around the world, which made it more difficult for developing nations to develop their own defense sectors.⁵⁸ Almost overnight, with the surplus supply of Soviet and Warsaw Pact weapons

⁵⁵ Andrew Middleton, Steven Bowns, Keith Hartley, and James Reid, "The Effect of Defense R&D on Military Equipment Quality," *Defense and Peace Economics* 17, no. 2 (April 2006): 117-139.

⁵⁶ *Ibid.*, 137.

⁵⁷ Neuman, "Stratification," 179.

⁵⁸ Bitzinger, *Problems*. 2.

and the United States' defense industries fiercely fighting for markets, the global market changed from a seller's to a buyer's market. Defense industries in both developed and underdeveloped nations have been forced to consolidate or close. The United States' aerospace defense industry, for example, went from 14 major companies to four in just three years.⁵⁹ How do nations with lower-quality and lower-technological equipment and an underdeveloped industry capacity compete? Developing nations can purchase more sophisticated equipment from developed nations at better prices than if they acquire them from indigenous sources.⁶⁰ It is like a "Mom and Pop" general store trying to compete with a global giant like Wal-Mart. Bitzinger sums it up well when he writes,

... amongst the most advanced and large-scale arms producing countries - e.g., the United States, Britain, and France - hundreds of thousands of defense workers have been made redundant ... as military factories have cut back production or closed down. However much the larger arms-producing states have been pummeled by these developments, the long-term viability of these countries' defense industries has never been in doubt. ... The same cannot be said for the smaller, "second-tier" arms-producing countries.⁶¹

1. Developed Nations' and Advanced Arms Industries in the Post-Cold War

To emphasize the difficulties of developing nations, one has to simply look at the difficulties facing developed nations' arms industries since the end of the Cold War. Defense industries from the West and former Soviet Block nations are all trying to adapt to the new world. Former Warsaw Pact nations with their existing advanced arms industry fared no better than some large developing nations and are facing the same challenges as developing or second-tier nations. Hungary and Slovakia, for example, both have an established advanced arms industry as a result of the Warsaw Pact. Jeffrey Bialos states, however, "... like other defense industries in Central and Eastern Europe, the more sophisticated equipment was often manufactured with key parts either imported

⁵⁹ Ann Markusen, "Should We Welcome a Transnational Defense Industry?" in *The Place of the Defense Industry in National Systems of Innovation*, Occasional Paper #25, ed. Judith Reppy (Cornell University: Peace Studies Program, April 2000), 5. <http://www.ciaonet.org/wps/rej03/index.html> (accessed November 9, 2006)

⁶⁰ Bitzinger, *Problems*, 3.

⁶¹ Ibid., 1.

from the Soviet Union or produced under Soviet license,”⁶² making the two nations more like second-tier producers than first. Both, however, are going through what China and other developing nation’s defense industries are currently going through. Yudit Kiss states, “... they have deep structural problems, serious financial burdens and insecure future prospects.”⁶³

The fact a nation is “developed” does not mean the country possesses a fully indigenous arms industry. Nor does it mean that if a nation becomes “developed” it will automatically have a domestic arms industry. In his research, Brauer lists developed and newly developed industrialized nations that do not have a fully native advanced arms industry.⁶⁴ For example, According to Dvir and Tishler, even a more developed nation like Israel suffered. “Israeli defense industry, like defense industries elsewhere, suffers from excess capacity and, hence, inefficient operation.”⁶⁵ Nations such as Hungary, Slovakia, and Israel have resources many other developing nations do not, such as technology, infrastructure, and human capital, are also struggling to survive.⁶⁶ This does not bode well for developing nations’ ambitions to develop or maintain their arms industries. Bitzinger sums it up nicely when he states,

Second-tier countries in all these categories share a number of growing challenges to their arms industries, which are only exacerbated by the brutal realities of the post-Cold War era. Arms production in these countries is already or increasingly overcapacitized, inefficient, and cost-ineffective. At the same time, the technological and resource demands of advanced weapon systems – and advanced armaments production – have grown at a rate beyond the abilities of most of these states to keep pace. Finally, the growing availability of relatively cheap, advanced weapons systems in a saturated, post-Cold War ‘buyer’s market’ for arms has undermined much of the rationale for continuing to produce arms indigenously.⁶⁷

⁶² Jeffrey Bialos, *The Bulgarian Defense Industry: Strategic Options for Transformation, Reorientation and NATO Integration*, The Atlantic Council of the United States Policy Paper, July 2001: 1. <http://www.ciaonet.org/pbei-2/acus/coc01/coc01.pdf> (accessed November 9, 2006)

⁶³ Yudit Kiss, “Defence Industry Consolidation in East Central Europe in the 1990s,” *Europe-Asia Studies* 53, no. 4 (2001): 604.

⁶⁴ Brauer, “Arms,” 12.

⁶⁵ Dvir, “Changing,” 1.

⁶⁶ Kiss, “Consolidation,” 604.

⁶⁷ Bitzinger, *Problems*, 2.

C. CONCLUSION

Developing nations' leaders after World War II had a tremendous burden of nation building that forced them to make a tough decision. Different factors shaped where the political will to use scarce resources lay. For many nations, trying to create an indigenous arms industry after World War II was like building a four-story house in which they have to build all four floors at the same time. The first floor of the house is national identity, the government, and educational institutions. The second floor is the basic infrastructure and industrial base. The third floor is the indigenous arms industry and the fourth is national security. All the floors are all competing for resources and stability. Different influences on a floor determined how much political capital there was to spend on each level. Like a conventional house, however, many of the elements of the lower floors need to be in place to build successful upper floors. The third floor, indigenous arms industry, requires the first two floors to be complete in order to be successful. The fourth floor, national security, often cannot wait for the third floor to be complete, so weapons are purchased to provide an instant third floor which is very costly forcing cut backs on other levels.

A look at countries that had advanced arms industries prior to the fall of the Iron Curtain illustrates how truly difficult it is for developing nations to maintain the industry. Even with the infrastructure in place and human capital to build it, the developed nations are having trouble maintaining the advanced arms industry and acquiring needed resources from the government. These difficulties illustrate how hard it will be for developed nations' advanced arms industries to catch up. A more ominous signal is, while developing nations are trying to catch up, even advanced European nations are having a hard time staying caught up with the United States.

There is a widening military-capabilities gap forming between the United States and Europe.⁶⁸ In conclusion, developing nations' indigenous advanced arms industries are facing poor prospects for developing their own wholly arms industry.⁶⁹

⁶⁸ Stephen J. Coonen, "The Widening Military Capabilities Gap between the United States and Europe: Does it Matter?" *Parameters* 36, no. 3 (2006): 67-84.

⁶⁹ Bitzinger, *Problems*, 4.

III. CHINA'S QUEST FOR AN INDIGENOUS ADVANCED ARMS INDUSTRY

For the past two decades, two giants, India and China are trying to take their place on the world stage economically and militarily. The purpose of the chapter is to examine the political and economic hindrances to China's development of the advanced arms industry. Its limited success in the advanced arms sector is surprising considering its growing economic power and political influence across the world. By focusing on what prevents China from successfully developing a wholly indigenous arms industry will shed light on what to expect from developing nations.

A. THE PEOPLE'S REPUBLIC OF CHINA (PRC): POST WORLD WAR II AND CIVIL WAR

When the PRC formed in 1949, it was a devastated nation. The Civil War, World War II, Sino-Japanese War, and the Opium Wars all left it depleted of resources. When the Communists took over China, its leaders, like those in other developing nations, wanted their country to grow and prosper. However, China took the Socialist/Leninist path, and the decision did not lead to prosperity.⁷⁰ In great undertakings, there are always unintended consequences and mistakes, and the Chinese Communist Party's decisions led to many. Communist ideology, international security threat, and some paranoia helped shape the Chinese political will that drove economic and industrial decisions. While not all developing nations are communist nations, many faced similar challenges as they try to create an indigenous advance arms industry. Here, I will discuss some of the actions the Chinese state took during the Mao Xuedong period that promoted or impeded the development of China's advanced arms industry.

Upon defeating Chiang Kai-shek and the Kuomintang forces in the civil war, the Chinese communists took over mainland China. The country had barely experienced industrialization and the war had devastated large segments of it.⁷¹ The civil war supplied an experienced and battle tested military but, according to Jonathan Pollack, Mao did not

⁷⁰ Eric Jones, Lionel Frost, and Colin White, *Coming Full Circle: an Economic History of the Pacific Rim*, (Boulder, CO: Westview Press, 1993), 125.; Kenneth Lieberthal, *Governing China: From Revolution Through Reform*, 2nd ed. (New York NY: W.W. Norton and Company, 2004), 85.

⁷¹ Dreyer, *PLA*, 142.; Lieberthal, *Governing*, 88.

consider them fully prepared for securing China. China's security, Mao further argued, "... could only be guaranteed by substantially enhancing the nation's military capabilities."⁷² China did not have a modern fighting force, or the capacity to produce one. They did, however, have significant number of people which led to Mao's concept of the "People's War." While he planned to overwhelm an enemy with human waves, he still wanted a modern military but the "People's War" concept and the Third Front eventually hinder the development of the arms industry.⁷³

B. MAO'S INDUSTRIALIZATION GOALS, INDEPENDENCE AND SELF RELIANCE

The PRC's objective was the creation of an indigenous arms industry capable of equipping the People's Liberation Army (PLA).⁷⁴ However, what China wanted to do, what it was capable of doing because of resources and technical limitations, and what it did were all different. Was this imbalance due to lack of trying, resources, or competence? Mao faced the challenge of governing a country with 541 million people however, his experience lay mainly in war fighting.⁷⁵ He faced the significant problems of how to industrialize, build a modern fighting force, and feed his people. As a developing nation, China could not afford to do everything it wanted. Therefore, the decision was made to seek the Soviet Union's aid in industrializing but even then the Chinese had to prioritize development. The Soviets provided resources and expertise. It was not until the Sino-Soviet split that self-reliance became an imperative.⁷⁶

1. Economics Development and Stability Take Priority at the Founding of the PRC

As with other newly formed countries following World War II, one of the first orders of business for the Communist regime was to create economic stability. The choice to place economic stability before the development of an arms industry was made in order to stay in power. The Communist realized that one of the factors leading to the

⁷² Pollack, "Military Power," 44.

⁷³ Naughton, "Third Front," 351, 356-357.

⁷⁴ Lieberthal, *Governing*, 76-77.; Huaqing, "Unswervingly," 1-2.

⁷⁵ AD Bradshaw and W. Block, "Introduction," *Journal of Applied Ecology* 26, No. 3 (1989): 747.

⁷⁶ Kenneth W. Allen, Glenn Krumel, and Jonathan D. Pollack, *China's Air Force Enters the 21st Century* (Santa Monica, CA: Rand, 1995), 71.; Andrew J. Nathan and Robert Ross, *The Great Wall and the Empty Fortress: China's Search for Security* (New York, NY: W.W. Norton and Company, 1998), 159.

downfall of the Kuomintang government was hyperinflation that eroded their legitimacy and support. In the early days of the PRC, the Communist made the choice to first contain inflation and rebuild the economy before focusing on other sectors.⁷⁷ To contain inflation, the Communists created a new currency and nationalized the banks, restoring confidence and stability for economic development.⁷⁸ With the heavy assistance of the Soviets, the early years of Import Substitution (ISI) produced growth in China.⁷⁹ The economic stability was not only to maintain legitimacy but to also provide the foundation for industrialization, economic development and to pave the way for the socialist revolution. In turn, this would help build their arms industry. Beijing's choice was to maintain power first through economic stability then industrialization.

2. Politics and the Korean War Force China to Rely on the Soviet Union

Chinese leaders, particularly Mao, reactions to political and security factors have played a critical role in hurting China's economic development. Although the Communist Party ran China, the most influential and dominant figure determining the political will was Mao.⁸⁰ All defense industries are influenced by the domestic situations, but China's defense industries were all nationalized State Owned Industries (SOEs). In the past six decades, as an authoritarian country, China's defense SOEs support was particularly impacted by changes in government, security environment, and economy. China's arms industry rode the rollercoaster of politics, achieving higher priority in times of a perceived threat and then took a back seat when the threat decreased. This pattern has persisted, hence, the problem facing the defense industry is when they are expected to perform in times of threat, past indifference and poor funding hamper their ability to perform and produce.⁸¹

One year after establishing the new communist country, Mao signed a treaty with the Soviet Union and also fought a war in Korea. At first, the United States had

⁷⁷ Dreyer, *PLA*, 142.

⁷⁸ Ibid.

⁷⁹ Robert G. Sutter, *Chinese Policy Priorities and Their Implications for the United States* (Lanham, MD: Rowman & Littlefield Publishers, 2000), 6.

⁸⁰ Lieberthal, *Governing*, 4.; Roderick MacFarquhar, *The Politics of China: The Eras of Mao and Deng*, 2nd ed., (Cambridge, UK: Cambridge University Press, 1997), 11-15.

⁸¹ See Chapter 2 of this thesis

contemplated maintaining relations with the PRC as a tool against the Soviet Union. The result of the choice to side with the Soviet Union and North Korea changed the equation and reinforced the United States' fear of communism's spread.⁸² The United States led a total embargo of western military technology and pushed the world to recognize the exiled Nationalists in Taiwan as the legitimate government of China.⁸³ Consequently, the PRC had no other choice but to deepen its ties with the Soviet Union for assistance in their economic and industrial development.⁸⁴ The Soviet connection is important to understand in why the development of China's advanced arms industry failed. The split with the Soviet Union over communist ideology and the future of communism, further isolated the PRC from the world. The Korean War did not help the country's quest for industrialization.

3. Soviet Influence

The PRC's isolation from the rest of the world by the United States had significant impact on the future development of China. As a result, China had to use Soviet technology and manufacturing techniques. The techniques set them down a path that was less effective than that of the west, magnifying the existing problems of the developing nation.⁸⁵

Mao looked to the Soviets in modeling China's economy and arms industry, but failed to realize China did not have the same infrastructure, urbanization, industrial and agricultural base the Soviets had. Urbanization, industrialization and development of the small agriculture sector were already underway prior to the Soviet's First Five Year Plan.⁸⁶ The Soviet model used surpluses from agriculture to finance industrialization. When the Chinese based their First Five Year Plan on the Soviet's, they did not take the difference into account. The oversight negatively impacted the First Five Year Plan and the development of the defense industry because the Chinese did not have the surpluses to put into industrialization, nor did they invest in agriculture to increase yield to produce

⁸² John Garver, *Foreign Relations of the People's Republic of China* (Englewood Cliffs, N.J.: Prentice Hall, 1993), 42-44.

⁸³ Lieberthal, *Governing*, 90.; Nathan, *Great Wall*, 61.; Garver, *Foreign Relations*, 44.

⁸⁴ Lieberthal, *Governing*, 90.

⁸⁵ Jones, *Full Circle*, 125-126.; MacFarquhar, *Politics*, 15-17.

⁸⁶ Medeiros, "New Direction," 18-19.

the surpluses.⁸⁷ China could not continue to squeeze agriculture and light industry and therefore, the Second Five Year Plan reflected the changed plan in agriculture and light industry. However, by the Third Five Year Plan, ideology and the security environment again changed political will that was guiding the state.

4. Sino-Soviet Split Left China Feeling Surrounded and Alone

The Sino Soviet split in 1959 cut off China from its only ally leaving it virtually isolated. After the break, China felt greatly threatened by the Soviets. The split was caused by the Soviet's destalinization, treaty with Mongolia, invasion of Czechoslovakia, and border clashes along the Chinese border.⁸⁸ Apart from the situation with the Soviets, United States' involvement in the second Taiwan crisis and the Vietnam War added to the Chinese insecurities. Beijing did not like the close proximity of United States' troops to Chinese borders.⁸⁹ Detente between the Soviets and the United States made the Chinese feel like both superpowers were against them along with their allies. China felt surrounded and alone.⁹⁰ The fear of being surrounded by two superpowers led to the concept of the Third Front which severely hampered the nation's defense industry.⁹¹

a. The Third Front

The Third Front had less to do with economic prosperity than it did with perceived survival. After the split with the Soviets, Mao believed China's coastal industrial base was too vulnerable to attack. Since the Chinese industrial heart was vulnerable to a United States naval or Soviet land attack, the plan called for the development of China's interior. Industrialization of the interior would allow China's war machine to function in the event the coast should fall.⁹² A threat to national security and the fact that China was cut off from sources of advanced weapons elevated the political capital for the indigenous defense industry.

⁸⁷ MacFarquhar, *Politics*, 93.

⁸⁸ Nathan, *Great Wall*, 44.; Naughton, "Third Front," 371.

⁸⁹ Daniel B. Wright, *The Promise of Revolution: Stories of Fulfillment and Struggle in China's Hinterland* (Lanham MD: Rowman and Littlefield Publisher, 2003), 18.

⁹⁰ Naughton, "Third Front," 368.

⁹¹ *Ibid.*, 351.

⁹² Naughton, "Third Front," 351.; John Frankenstein, "China's Defense Industries: A New Course?" in *The People's Liberation Army in the Information Age*, ed. James H. Mulvenon and Richard H. Yang (Santa Monica, CA: Rand Corporation 2005), 190.

From 1966-1976 China put 40 to 60 percent of its budget into the Third Front.⁹³ However, the attempt to put the defense industry first had negative affects with dire consequences. Not only did it hurt the defense industry, it also put China's economic development decades behind illustrating that even when the political will and resources are spent, it does not guarantee success in creating an advanced arms sector.⁹⁴

The Third Front, in effect, started China's industrialization over from the beginning, putting them further behind where they should have been had they been able to share technology. The new plan wasted vast material and human capital resources.⁹⁵ Crucial for modernization, the Third Front skimmed on research and development and the industrialization of the interior was rushed, isolated, and did not take advantage of economy of scale.⁹⁶ The perceived threat seemed so immediate that the defense industry was not developed in rational and efficient manner. The plan was also not designed to create a fully indigenous advanced arms industry. Except for nuclear weapons and missiles, the Third Front was designed to supply weapons in mass for a "People's War," not create an infrastructure to design and build sophisticated weapons.⁹⁷ The People's War concept was to use the three operational tactics of space, time, and force. Sheer numbers of people would overwhelm the enemy given time and space, requiring less technologically sophisticated equipment. The coast, where the industry was, became the space to spread the enemy out and overwhelm them. Whereas, the industry was to be hidden in the interior. China could allow the coast to fall and still have weapons producing capability. However, only certain sectors were properly funded and managed. The only advanced defense industry with political capital was the nuclear and missile programs.

⁹³ Wright, *Promise*, 18 and 120.; Frankenstein, "Defense Industries," 190.; James Mulvenon, "Soldiers of Fortune: The Rise and Fall of the Chinese Military Business Complex 1978-1999," *Paper 15* (Bonn, GE: Bonn International Center for Conversion, October 1999), 6.

⁹⁴ Naughton, "Third Front," 351.; Frankenstein, "Defense Industries," 190.

⁹⁵ Medeiros, "New Direction," 13.

⁹⁶ Naughton, "Third Front," 376.

⁹⁷ Lewis, "Search," 67.

C. NUCLEAR WEAPONS AND MISSILES GROW UNDER MAO WHILE THE FIGHTER INDUSTRY LANGUISHES

In my hypothesis, I proposed advanced arms industries will not fully materialize in developing nations. Leaders do not have the political will to use their scarce political capital and economic resources on the industry because of other competing developmental interests. I state, however, that certain sectors within the defense industry can garner the political capital and resources to develop and mature. One of the few successes China's advanced arms industries has had is its nuclear and missile programs. Similar development's have taken place in India as I shall show in the next chapter. What has led to the success in China's nuclear and missile programs but its failure in the fighter industry is political will. Mao committed the resources and human capital for one but not the other.

The factors that determine the use of limited resources in the defense industry is not static and changes over time. In China, the fighter industry's importance rises and falls depending on the domestic and international climate. The nuclear program, however, is not affected by the changing of seasons. There is a consistent support for nuclear research because it provides greater returns on investment.

1. Strategic Weapons

The sector of the defense industry that Chinese leaders willingly focused their scarce resources on was strategic weapons programs (nuclear bombs and missiles).⁹⁸ Given the availability of low resources, it was an obvious choice to develop. Evan Feigenbaum writes, that because of the "... gaping holes in Chinese aircraft and other conventional industries made strategic weapons the best options.⁹⁹ First, nuclear weapons bring international prestige and security through deterrence.¹⁰⁰ Second, nuclear research can be applied to civilian purpose of providing nuclear power. Once you have the nuclear weapons, they require a delivery system resulting in a missile program. It is afforded higher importance (greater political capital) than a program such as fighters because of its close association with the success of another vital program. A nuclear

⁹⁸ Frankenstein, "Defense Industries," 193.

⁹⁹ Feigenbaum, "Soldiers," 296.

¹⁰⁰ See Chapter 2 of this thesis

missile provides prestige and national security. Unlike fighters, only a few nuclear missiles will make an adversary think twice before attacking.

With all its political capital, the nuclear and missile industries received more resources and research than any other defense industries. More importantly, during the Cultural Revolution, Great Leap Forward, Hundred Flowers, and other campaigns the nuclear and missile programs' human capital received protection. Unlike most other defense industries, the nuclear and missile sector did not suffer purges of its intellectuals.¹⁰¹

2. Fighter Program

Looking at the fighter industry is a good representation of the low status afforded non-strategic weapons programs.¹⁰² The indigenous fighter industry did not fare as well as the nuclear and missile programs under Mao for a number of reasons. While the fighter industry has dual uses, the aviation industry does not bring international prestige like nuclear research. In addition, nuclear weapons create a deterrence that is not matched by fighters or bombers. Therefore, in China, the fighter industry did not receive the resources the nuclear program did.

In addition, the fighter industry had deficient and poor oversight in the use of what little resources it had.¹⁰³ The inadequate oversight was due to Soviet techniques but also government bureaucracy which was not held accountable for failures and purges of those with technical abilities.¹⁰⁴ Lewis and Litai write, during the Third Front era "... the aviation ministry wasted 65.8 percent of its R&D funds."¹⁰⁵ When Mao died, the result was that the native fighters had obsolete systems which were based on leftover 1950s Soviet designs and techniques.¹⁰⁶ Therefore, China was a second-tier arms producing nation at phase three of development. In addition to wasting resources, the

¹⁰¹ Cole, "Advanced," 170-171.

¹⁰² Medeiros, "New Direction," 9.

¹⁰³ Lewis, "Search," 66.

¹⁰⁴ For detailed explanation why it worked for the Soviets and not the Chinese see Crane, "Modernizing," 150-153.

¹⁰⁵ Lewis, "Search," 68.

¹⁰⁶ Wortzel, *Potential*, 16-17.; Cole, "Advanced," 170-171.

aviation industry spread what little resources it had among many projects.¹⁰⁷ China produced only one partial success that was outdated on delivery.¹⁰⁸

The fighter industry also did not receive the political protection afforded the nuclear industry during the political campaigns and purges. Communist Party's moves to consolidate power and continue the revolution resulted in the fighter industry drained of its human capital as fighter designers and engineers became targets of the purges.¹⁰⁹ The targeting of the very people needed to develop and modernize the fighter industry, lack of resources, and poor oversight resulted in an overall failure when it came to a fully domestic fighter industry.

D. DEFENSE SECTOR IN THE POST MAO PERIOD

The lack of support to develop the defense industry over other sectors did not fair any better after Mao's death. After a short power struggle, Deng Xiaoping took the mantle of leadership of China in 1977. At the time, China was industrially lagging behind its neighbors. China's defense industry was also 20-30 years behind and only capable of producing 1950s Soviet based systems.¹¹⁰

Decreased threat perceptions based on a changing international environment allowed Deng to focus on economic development rather than defense. According to Huaqing, "Deng Xiaoping put forward a thesis that a world war would not break out for a fairly long time, bringing a strategic change to the guiding ideology for army-building."¹¹¹ Without an external threat, the political capital of the defense industry dropped significantly. Deng sought to catch up on lost economic opportunities, restarting China's economy, and close the gap with the rest of the developed world. The choice brought an end to Mao's developmental disaster known as the Third Front and refocused China's political will almost entirely on economic development.

¹⁰⁷ Lewis, "Search," 67.

¹⁰⁸ Wortzel, *Potential*, 16-17.

¹⁰⁹ Allen, *China's*, 71.; Lewis, "Search," 68.

¹¹⁰ Cole, "Advanced," 170-171.

¹¹¹ Huaqing, "Unswervingly," 1-2.

1. Economic Development First

The new development model switched the PRC from the ISI to foreign direct investment (FDI). FDI is one of the most important contributing factors to China's extraordinary economic growth in the current context. Fifty percent of the FDI coming into China is in the form of joint ventures.¹¹² In 1994, it accounted for 13.9 percent of industrial output and 37 percent of foreign trade. By 1995, with a few exceptions like the defense industry, everything was open to FDI and 100 percent foreign-owned enterprises were allowed.¹¹³ Since 1992, China has received the most FDI in the developing world.¹¹⁴ Under Deng's reforms and changes, civilian industry took off but the defense industry continued to lag.¹¹⁵

Deng proposed the Four Modernizations to restart China's economy. The Four Modernizations are industry, agriculture, science and technology, and national defense. Military modernization and indigenous development is the lowest priority.¹¹⁶ The first priority, civilian economic development, is envisioned as a way to help military industrial development by generating resources and industrial capabilities that can be transferred to the defense industry.¹¹⁷

Although civilian economic development has led to exceptional economic growth in China, there has not been a significant increase in the defense budget. This is particularly true when inflation is factored in. According to Cole and Godwin, with all the economic growth of China in the past decade, it "... has not yet approached the research and production capabilities that mark a major military power. Placing national defense fourth in the 'Four Modernizations' investment priorities established in 1978 took its toll on the defense industries."¹¹⁸

¹¹² Nathan, *Great Wall*, 166.

¹¹³ Ibid., 170, and 177.

¹¹⁴ Thomas G. Moore, *China in the World Market: Chinese Industry and International Sources of Reform in the Post-Mao Era* (Cambridge, UK: Cambridge University Press 2002), 3.

¹¹⁵ Cole, "Advanced," 166.; Medeiros, "New Direction," 4 and 10.

¹¹⁶ Bates Gill, "Chinese Military Technical Developments: The Record of Western Assessments, 1979-1999," in *Seeking Truth From Facts*, eds., Mulvenon and Yang (Santa Monica, CA: Rand Corporation, 2001.) 155.

¹¹⁷ Wortzel, *Potential*, 4.

¹¹⁸ Cole, "Advanced," 166.

2. Quest for Legitimacy Increased the Political Capital of Economic Development

The primary focuses of Chinese leaders' is to stay in power and maintain their legitimacy.¹¹⁹ Even before China became the only real bastion of communist power remaining in the world, establishing legitimacy in the eyes of their people and the world was a top priority. If Beijing could not establish their legitimacy through Communist ideals, then they would do it by focusing on economic growth.

As China's economic development takes off, it continues to face a deficit of resources and challenging internal domestic problems. Solving internal domestic problems through economic development has more political capital than producing advanced weapons. The defense industry has suffered because of the choice to solve domestic problems.¹²⁰ It is not that Deng or subsequent leaders thought military modernization of the PLA and defense industry is unimportant. Economic development is seen as a means to fund modernization.¹²¹

While the external threat has greatly dissipated, the internal domestic threat is ever present. The economic growth and prosperity Beijing pins their legitimacy to is a double-edged sword. Unemployment is rising, the inequality between the rich and poor is growing, environmental problems have worsened, and corruption remains ever present.¹²² Poverty and desperation can cause social tensions but so can a widening gap between the haves and have nots.¹²³ Social tensions have been rising in China as have the protests and demonstrations. There were 8,700 mass disturbances in 1993, a figure which rose to 83,000 in 2005.¹²⁴ Increased social tensions lower the importance of an indigenous advanced arms industry and increase the importance of economic reform.

¹¹⁹ Wright, *Promise*, 170-172.; United States Department of Defense, *Defense Annual Report to Congress: Military Power of the People's Republic of China 2006*. Washington D.C. GPO, 2006. 8.

¹²⁰ Medeiros, "New Direction," 4.

¹²¹ Wortzel, *Potential*, 4.; Jiang Zemin, *Report at 16th National Party Congress*, November 17, 2002. FBIS-CHI-2002-1117

¹²² Sutter, *Policy Priorities*, 20.; For more information on the pollution problems read *The River Runs Black* by Elizabeth C. Economy (Cornell University Press, 2004).

¹²³ Keidel, "Social Unrest," 1 and 3.; Sutter, *Policy Priorities*, 19-20.

¹²⁴ Jae Ho Chung, Hongyi Lai, and Ming Xia, "Mounting Challenges to Governance in China: Surveying Collective Protestors, Religious sects and Criminal Organizations," *The China Journal*, no. 56 (2006): 1.; Sutter, *Policy Priorities*, 19-20.; United States Department of Defense, *Report to Congress*, 8.

3. Civilian Industry as the Foundation

The priority of the Four Modernizations show China is trying to create the civilian economic base before building an advanced arms industry.¹²⁵ In addition to solving legitimacy problems, the building of the commercial industrial sector is seen as a way to generate resources, develop the technological base, and build infrastructure to modernize the defense industry.¹²⁶ For the most part, however, it is not clear if this is a successful strategy. The defense industry is falling behind the civilian sector and not producing advanced weapons which are competitive with foreign manufacturers in developed nations.¹²⁷

a. Technology Transfer

The often assumed ability to transfer technology from civilian to military use is not working well in China. The goal of developing the economy first, instead of the military industrial complex, implies that in addition to resources and infrastructure there will be technology that can be adapted to military use. The track record of developing nations' ability to transfer civilian technology to the defense industry is poor. China too is having a hard time applying civilian technology to weapons systems.¹²⁸ Even if China can apply dual use technology in a weapon system, they have to make it work with what they already have. Cole and Godwin write, "... system and technology integration is a complex, demanding requirement ... only slightly less critical is the precision required to manufacture advanced-technology systems, a capability not well established in China's industrial base."¹²⁹ Transfer of technology and integration are failing for the same reasons as the defense industry. Since political will is focused elsewhere, it lacks resources for research and development, human capital and suffers from poor oversight.¹³⁰

¹²⁵ Lewis, "Search," 83.

¹²⁶ Wortzel, *Potential*, 4.; Zemin, *Report*.

¹²⁷ Medeiros, "New Direction," 10.

¹²⁸ Cole, "Advanced," 167.

¹²⁹ *Ibid.*, 165.

¹³⁰ Michael Bryant, "Modernized Dragon: China Aims for a Leaner, Rapid-Reaction People's Liberation Army," *Jane's International Defence Review* 39 (2006): 34.

4. State Owned Enterprises (SOEs) in the New Era

Chinese transition to an export economy and entry into the World Trade Organization (WTO) required reform of China's SOEs for a number of reasons. The most important is lowering of protectionist barriers to foreign competition.¹³¹ The inefficient SOEs now have to compete with foreign manufacturers.¹³² It also has to compete with the domestic private sector fighting for market shares. As private domestic competition increase, the plight of the SOEs is getting worse. Wortzel found SOEs drain resource from the defense industry and the economy as a whole. In addition SOEs "... are operating at a loss of about 1 percent of China's GDP each year."¹³³ Funds used to cover the losses of the SOEs drains money from the development of the defense sector.

The problems of the SOEs hurt the defense industry in other ways. Beijing is forcing defense SOEs to sell or divest itself of profitable portions while keeping the unprofitable portions. Due to lack of resources during the late Mao and early Deng era, the PLA operated SOEs produced products that were not defense related to generate funds. More specifically, John Roos found as little as 10 years ago the PLA operated "... more than 15,000 business enterprises and 50,000 factories ... [and] civilian production dominated 70 percent of the Chinese military manufacturing base."¹³⁴ Even though there was waste and PLA officers stuffed their pockets, the SOEs produced a necessary source of revenue which now the PLA is divesting from. To add insult to injury, the defense industry is forced to keep SOEs that are unprofitable draining additional resources for employment reasons.

In addition, like most of the defense industries in the developing world after the end of the Cold War, China's defense SOEs are facing budget cuts and excess capacity. Like those in the less developed nations, Chinese defense manufacturers are inefficient and technologically backward.¹³⁵ Over capacity caused by the end of the Cold War and the small domestic market coupled with waste and inefficiency has made the defense

¹³¹ Nathan, *Great Wall*, 164.

¹³² Moore, *World Market*, 56, 299, 310-311.

¹³³ Wortzel, *Potential*, 4-5.

¹³⁴ Roos, "New," 40.

¹³⁵ Jane's, "Post-2000," 25.

SOEs into money losers. Medeiros, Cliff, Crane, and Mulvenon write that “... according to the director of the State Commission on Science Technology and Industry for National Defense (COSTIND), for eight consecutive years, from 1993 to 2001, China’s entire defense industry, in aggregate terms, ran a net loss.”¹³⁶ SOEs no longer wanted to produce defense equipment because it is not profitable, hampering indigenous defense development.¹³⁷

In addition to the defense SOEs feeling the pressure of the new China, the defense industries’ human capital and research and development is also suffering. The vital defense research and development centers are not only losing funding but defense research facilities are turning to commercial research because it is more lucrative.¹³⁸ Worse yet, the expertise required to create advanced weapons technology is seeking employment outside the industry where the benefits are better.¹³⁹ Thus money, human capital, and research facilities are taken away from China’s advanced arms industry hampering their ability to modernize and create a fully indigenous industry.

a. SOEs as Social Safety Nets

Besides funneling resources to economic development, the quest of the Communist Party to maintain their legitimacy hurts the defense industry in other ways. Another reason plants do not want to undertake defense production, is because they are used as social security for the masses. Reforms and world competitiveness caused by the export economy is not creating enough jobs in China to replace the jobs lost. Chinese jobs are cut to make SOEs more efficient and competitive against the world and other Chinese companies. Rising unemployment increases social pressures.¹⁴⁰ To keep unemployment and social unrest down, SOEs are forced by the state to keep workers who do not have jobs or are unproductive, draining money from SOEs and causing financial problems.¹⁴¹ The choice to keep workers is one of the reasons 81 percent of the defense

¹³⁶ Medeiros, “New Direction,” 8.

¹³⁷ Cole, “Advanced,” 167.

¹³⁸ Ibid.

¹³⁹ Gill, “Technical Developments,” 153.

¹⁴⁰ Sutter, *Policy Priorities*, 20.

¹⁴¹ Crane, “Modernizing,” 174.; Medeiros, “New Direction,” 48.

SOEs lost money in 1994.¹⁴² Although the thought behind the Four Modernizations is that the civilian side will provide for the defense industry, the transition has yet to occur.

5. Defense Industry Falling Further Behind Developed Nations

Due to its low political capital, China's advanced arms industry is falling further behind advanced nations and China knows it.¹⁴³ Nathan and Roberts write that "... most of the PLA continues to be equipped with old-fashioned, Chinese-made, Soviet-style tanks and planes. Specialists on the Chinese military have described the PLA as the world's largest military museum and as a junkyard army.¹⁴⁴ They also know they cannot catch up through licensing and importation alone but continue to do so while they try to modernize and create a domestic industry. At the same time the advanced nations' modernization is reaching a new level of sophistication. In his review of China's Air Force Kenneth Allen writes, "... the [Chinese] aviation industry continues to have a sprawling organization with weak facilities and low standards, and the gap between it and the aviation industries of developing western countries is widening."¹⁴⁵

The Gulf War showed the equipment and concepts with which China designed their military doctrine was extremely vulnerable to modern weapons.¹⁴⁶ In addition, the under funded and underdeveloped sectors of their advanced arms industry, fighters, was one of the main components of the RMA.¹⁴⁷ Although the importance of airpower in RMA was demonstrated by the war and recognized by China, it still places airpower low

¹⁴² Cole, "Advanced," 166.

¹⁴³ Lewis, "Search," 69.; David Lampton, *China and the Strategic Quadrangle: Foreign Policy Continuity in an Age of Discontinuity*, (Council on Foreign Relations, 1995), 69.; David Shambaugh, "China's Military Views the World: Ambivalent Security," *International Security* 24, no. 3 (1999-2000): 57-61.

¹⁴⁴ Nathan, *Great Wall*, 146.

¹⁴⁵ Kenneth W. Allen, "PLA Air Force Operations and Modernization," in *People's Liberation Army After Next*, ed. Susan M. Puska (Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, 2000), 194.

¹⁴⁶ Lewis, "Search," 77.; Cole, "Advanced," 162.; Nathan, *Great Wall*, 146.

¹⁴⁷ Richard P. Hallion, "Precision Weapons, Power Projection, and the Revolution in Military Affairs," (USAF Air Armament Summit, USAF, Eglin AFB, Florida. May, 26 1999) <https://www.airforcehistory.hq.af.mil/EARS/Hallionpapers/precisionweaponspower.htm> (Accessed 10 Sep 06.)

in priority next to nuclear and missile development. The fighter industries political capital continues to remain low while strategic weapons' remains high. Lewis and Litai state,

For a quarter century, the defense industry received mixed messages. Despite ritual calls to build up the conventional forces, the industry's main target remained the development of nuclear weapons and their delivery systems, and everyone knew that this goal took primacy over all others. Money, expertise, and political backing told the real story, and promotions went to those who made their mark in the strategic programs. Where it mattered, few truly cared about the aviation industry.¹⁴⁸

One of the reasons China cannot catch up is that they underfund research and development compared to developing nations.¹⁴⁹ The technological bar is not stationary. By the time China finishes the research and development on a project and has the infrastructure in place, they will still be behind. Stephen Cohen writes, "... as India and China have demonstrated, it is difficult to establish a domestic weapons industry without having it lapse into obsolescence."¹⁵⁰ China's defense research and development sector that do not deal with strategic weapons, lacks resources.¹⁵¹ The resources go toward higher priorities such as civilian industrial development and keeping a lid on social tensions.

E. FIGHTERS IN THE POST-MAO PERIOD

The literature points to the fact that the Chinese know modern advanced weapons, especially airpower, are vitally important. The importance is made even clearer by the first Gulf War and the conflict in Kosovo. While there is much discussion on the importance of air power, they still have not backed the rhetoric with the resources since the Gulf War. It continues to rank low in priorities compared to strategic weapons and has been hurt by the quest for nuclear weapons and missiles. Also, the civilian aviation

¹⁴⁸ Lewis, "Search," 76.

¹⁴⁹ Eiseman, *Federal Investment*, 50.

¹⁵⁰ Stephen P. Cohen, "Toward a Great State in Asia?" in *Military Power and Policy in Asian States: China, India, Japan*, ed. Marwah, Onkar and Jonathan D. Pollack (Boulder, CO: Westview Press, 1980), 30.

¹⁵¹ Lewis, "Search," 76.

industry is not contributing to the advancement of the fighter industry as envisioned.¹⁵² The result is 90 percent of the Chinese's Air Force is obsolete with 1950s and 1960s technology and China is still incapable of producing indigenous fighters.¹⁵³

1. Obsolete Fighters

One of the best examples of China's fighter industry's failure to produce relevant products is the J-8 interceptor. Lewis and Litai's research reveal that "... this aircraft began development in 1964, was first flight tested in 1969, and entered service in the early 1980s. Even after a 20-year gestation period, the PLAAF still found the J-8 unsatisfactory and, as late as 1989, dubbed it an 'operational test aircraft.'"¹⁵⁴ China's advanced arms industry is unable to produce domestic products and continues to receive assistance from the Russians and the West. Lewis and Litai go on to say, the "... improved J-8-2s began service with the naval air arm in 1992. This is a total of almost 30-year development period for what remains a below-par combat aircraft-not yet the equivalent of a 1960s-era U.S. F-4 Phantom."¹⁵⁵ At the time the J-8-2 was becoming operational, the United States was fielding the stealthy F-117 fighter and B-2 Bomber while starting research on what is now the F-22 Raptor. Now operational, the F-22 is a perfect example of RMA and how far China has to go to catch up. With China not able to even produce advanced aircraft in the league of the F-15 and F-18 shows how far behind they are. This failure is not just in the fighter industry but represents most others defense industries except strategic weapons.¹⁵⁶

Another example is the continued licensing (phase three) of the production of the Russian Su-27s which is close behind the capability of F-15 and F-18s. Though the Gulf War showed how important airpower was, China is still licensing production of Russian fighters that represent 1970s technology. In addition, the Chinese have to return the aircraft to Russia for routine maintenance demonstrating of how far behind China is from developed nations in terms of technological advancement.¹⁵⁷ Bernard and Cole suggest

¹⁵² Crane, "Modernizing," 245.

¹⁵³ Nathan, *Great Wall*, 146.

¹⁵⁴ Cole, "Advanced," 193.

¹⁵⁵ *Ibid.*, 194.

¹⁵⁶ Medeiros, "New Direction," 9.

¹⁵⁷ Cole, "Advanced," 194.

that "... by the time China is capable of producing Su-27s without Russian assistance, it is likely ... [to be] the most highly perfected obsolescent combat aircraft in the world."¹⁵⁸

F. SUPPORT FOR NUCLEAR WEAPONS AND MISSILES, POST MAO, REMAINS THE SAME

As during Mao's period, the nuclear and missile programs still have more political capital than any other defense industry for mostly the same reasons. Beijing, knowing they had limited resources and not wanting to have the budgetary burdens of the defense industry that help facilitate the fall of the Soviet Union, once again has to be selective of what programs to develop.¹⁵⁹ Like the nuclear program, the missile program has both civilian commercial and military uses. As the world becomes more reliant on satellites and other space based systems, the missile program grows in importance both economically and militarily.¹⁶⁰ The nuclear weapons and missile programs continue to get people and resources.

Defense spending as percentage of government spending continues to fall. As percent of government spending, it was 40 percent in 1950 (Third Front), 15 percent in 1970, and 8 percent in 2000. These numbers are more important when we look at that in the context of the overall GDP. As percent of GDP, defense spending was 5.5 percent in 1979, 1 percent in 1996, and 1.7 percent in 2003.¹⁶¹ However, government income has increased as China's economy has grown. These numbers illustrate the choice of not spending the surplus on the defense industry but on economic growth. To bring home the inequalities between the strategic weapons programs and the fighter programs in China, all one needs to do is compare their core capabilities. According to a study commissioned by the United States Department of Defense, there are 84 critical areas to an indigenous advanced arms industry. According to Cole and Godwin, the only area where China has all the production capabilities is "nuclear weapons and nuclear material processing. ... In essentially all other areas of critical military technologies, China is extremely deficient."¹⁶² In the nuclear arena, China has most or all of the production

¹⁵⁸ Cole, "Advanced," 165.

¹⁵⁹ Medeiros, "New Direction," 24-25.

¹⁶⁰ *Jane's*, "Post-2000," 25.

¹⁶¹ Medeiros, "New Direction," 109-110.

¹⁶² Cole, "Advanced Military," 172.

capabilities in 13 of the 13 categories.¹⁶³ Comparing the nuclear industrial capability to the fighter industry the difference is compelling. While the nuclear sector has production capabilities in all categories, the fighter industry is only capable in 2 of 25.¹⁶⁴

G. CONCLUSION

China's indigenous advanced arms industry as a whole will not catch up because they have not made creating a fully domestic advanced arms industry a priority in comparison to other sectors such as the nuclear sector. Although one may argue that in an authoritarian country, leaders would not have to worry about what the people thought because they are not elected. I have, however, illustrated that maintaining legitimacy is a big concern, more important than developing an advanced arms industry. The Chinese continued focus on economic growth and maintaining employment to prevent social unrest demonstrates this. Even the definition of self reliance has changed indicating the goals have changed. Instead of having a fully indigenous advanced arms industry (first-tier arms production nation), the Chinese are content with having a second tier. Huaqing states,

When we stress self-reliance, we do not mean we will close the door to pursue our own construction. What we mean is to actively create conditions to import advanced technology from abroad and borrow every useful experience ... rely on our own strength for regeneration, while selectively importing advanced technology from abroad, centering on some areas.¹⁶⁵

Just because China's economy has grown tremendously over the last few decades does not mean they have unlimited budget to spend on their advanced arms industry. Although it does not have exactly the same challenges it did under Mao, it is still a developing nation with all the problems a nation faces traveling toward the goal of modernity. They face growing inequality between rich and poor, a massive population, pollution, an aging population, a banking industry on the verge of collapse, and growing energy needs.¹⁶⁶

¹⁶³ Cole, "Advanced," 173.

¹⁶⁴ Ibid., 192-193.

¹⁶⁵ Huaqing, "Unswervingly," 19.

¹⁶⁶ Brook Larmer, "Manchurian Mandate," *National Geographic* 210, no. 3 (September 2006): 50.

Beijing can put military modernization ahead of the economy if it chose to use its growing resources there, but it does not. Even if China did, I doubt, due to corruption and other problems plaguing China, they could do it. Also, politically I do not think the regime would survive if they made military advancement a priority. The increased social tensions it would create by diverting funds away from economic development would eliminate the regime's legitimacy. In addition, it may be too late for China in terms of technological advancement. Future advanced weapons will be so expensive that no nation will be able to develop and procure them on their own. The future for China's advanced arms industries is joint development as it may be for most of the world.

IV. INDIA'S QUEST FOR AN INDIGENOUS ADVANCE ARMS INDUSTRY

Of the world's developing nations, two giants, India and China, are trying to take their place on the world stage economically, politically, and militarily. India and China were both influenced by "Uncle Joe" Stalin's successful industrialization of the Soviet Union. Although industrializing placed many in desperate conditions across the world, industrialization of the Soviet Union under Stalin was excessive.¹⁶⁷ It is a method that could be duplicated in China but clearly not in a democratic India. The purpose of this chapter is to examine what hinders India's development of an advanced arms industry where only some of the smaller sectors have been successful. If this growing power cannot create a fully indigenous arms industry then there is little hope that developing nations with lesser resources will succeed. According to John P. Lewis, writing on Indian political economy,

Save for China, the Indians had the biggest playing field-biggest in terms of the numbers of people, scale and varieties of terrain, varieties of natural resources, and the country's early scatter of industrialization-on which to play out a strategy of self-reliance on the lines of a closed economy.¹⁶⁸

A. INDIA IN POST WORLD WAR II

India, like China, is a rising world power and is on the verge of achieving the economic success that South Korea, Taiwan, and Singapore have achieved in the post-World War II era. According to Nicholas Burns, "Within the first quarter of this century, it [India] is likely to be numbered among the world's five largest economies."¹⁶⁹ For India, this is would be a great achievement given that at the time of independence in 1947, India was an impoverished country with a majority of the population facing dire conditions. It is daunting to think of what the leaders of India had to do to create a nation and all that is associated with that undertaking. The leaders of India were trying to

¹⁶⁷ Zbigniew Brzezinski, *Out of Control: Global Turmoil on the Eve of the 21st Century* (New York, NY: Macmillan Publishing, 1993), 11.

¹⁶⁸ John P. Lewis, *India's Political Economy: Governance and Reform* (Delhi: Oxford Press, 1995), 10.

¹⁶⁹ R. Nicholas Burns, "The United States and India: An Emerging Entente?" *DISAM Journal of International Security Assistance Management* 28, no. 1 (2005): 104.

industrialize while at the same time dealing with a mass migration caused by the partition, poverty, wars, drought, and floods.

India was left with the legacy of colonialization, which drained the country of large number of its resources, at the same time, left some institutions which have been beneficial in the current world. Most importantly, the British left India with a functioning bureaucracy more than capable of running a country, an English speaking population, and a military that was rooted in civilian control. On the other hand, concerning the defense industry, the British left behind basic small arms and artillery sector not capable of creating advance weapons, which is phase one of Dvir and Tisher's four phases of defense industrial development. According to Onkar Marwah,

The country had acquired about a dozen ordinance factories but the only lethal weapons produced (when imported gun metal was available) were the Lee-Enfield rifles, light machine guns, and rudimentary artillery pieces. There were no aircraft or naval ship-building facilities other than at the level of repair and refitting, no research or design facilities for armament manufacture.¹⁷⁰

Although having some industry gave it some advantage over China after independence, India faced the same lack of resource problem. The two countries had too much to do to catch up and too little to do it with.

B. NEHRU'S DEVELOPMENT GOALS

After independence from Britain and the partition of the Indian subcontinent in 1947, the newly established government of India was dominated by Jawaharlal Nehru and his political party, the Indian National Congress (INC). In comparison to Mao in China, Nehru was also a dominant figure in India's early development.¹⁷¹ Also like Mao and the communists in China, Nehru and the INC had to prioritize development and use of resources to build a new country. Nehru's goal for India was to build India into a

¹⁷⁰ Onkar Marwah, "India's Military Power and Policy," in *Military Power and Policy in Asian States: China, India, Japan*, ed. Onkar Marwah and Jonathan D. Pollack (Boulder, CO: Westview Press, 1980), 108.

¹⁷¹ Stanley Wolpert, *A New History of India* (New York: Oxford University Press, 2000), 354.

modern state through self-reliance.¹⁷² According Reeta Tremblay, he was “... faced with the challenging tasks of nation building and economic development ... to create an egalitarian society in which a ‘quick and progressive rise in the standard of living should be the primary consideration governing all economic activities.’”¹⁷³ Nehru’s political will was focused on economic development and needs of the people. The condition of the defense industry was least of his priorities. Consequently, the defense sector saw a reduction in budgets under the Nehru administration.¹⁷⁴

1. Influences on Nehru and His Developmental Strategy

Jawaharlal Nehru’s development policy can be said to have many influences but the most important are socialism, historic memory, and Soviet planned development.¹⁷⁵ The socialist influences led to the adoption of five-year economic plans in India which were styled after Soviet development strategy. Whereas the historical memory left a number of fears which also influenced Nehru’s policies as the Prime Minister of a post-colonial state. First was the global economic downturn during the Great Depression and the subsequent drop in global trade.¹⁷⁶ Second, was the fear of colonialism. Nehru believed if India could not gain economic independence and become self-reliant, India would become an economic colony to other nations again. Finally, he feared and disliked the military, greatly influencing the defense industry development.

Though the goal was called self-reliance, it was, one may argue, just another name for import substitution (ISI).¹⁷⁷ The downside of ISI is costs because a nation is not tanking advantage of their comparative advantage. Trying to compete where they do

¹⁷² Weisskopf defines economic self-reliance as “the ability of nationals of a country – rather than foreigners – to make decisions that affect economic activity within the country.” Thomas E. Weisskopf, “China and India: Contrasting Experiences in Economic Development,” *American Economic Review* 65, no. 2 (1975): 356.

Wilfred Malenbaum, “Comparative Costs and Economic Development: the Experience of India,” *American Economic Review* 54, no. 3 (1964): 391.

¹⁷³ Reeta Chowdhari Tremblay, “Growth with Justice: Understanding Poverty,” in *The Indian Handbook*, ed. C. Steven LaRue (Chicago, IL: Fitzroy Dearborn Publishers, 1997), 88.

¹⁷⁴ Marwah, “Power and Policy,” 108.

¹⁷⁵ V.V. Bhatt, “Development Problem, Strategy, and Technology Choice: Sarvodaya and Socialist Approaches in India,” *Economic Development and Cultural Change* 31, no. 1 (1982): 91.

¹⁷⁶ George Rosen, “Planned Development and the Search for Self-Reliance,” in *The Indian Handbook*, ed. C. Steven LaRue (Chicago, IL: Fitzroy Dearborn Publishers, 1997), 62.

¹⁷⁷ Robert M. Rosh, “Third World Arms Production and the Evolving Interstate System,” *Journal of Conflict Resolution* 34, no. 1 (1990): 58.

not have a natural edge over other nations increases the cost of production. In addition, with no infrastructure in place to create the goods or an economy of scale, it raises production costs. Wilfred Malenbaum, writing on comparative cost and economic development in India, writes that ISI kept new private industry small and inefficient, and “...domestic production costs for many import substitutes are at least that much [40 to 50 percent] above the landed cost of equivalent foreign goods.”¹⁷⁸ The political will was to create a nation economically independent from other powers, even if in the short term, the cost was more. The drain of financial resources caused by increased prices made fewer resources available for the defense industry.

a. *India’s Five Year Plans and the Impact of the Defense Industry*

Central planning and control of major industry requires the government to develop a strategy or roadmap for development. As mentioned before, the blueprints Nehru and his government used to attempt and achieve their development goals were Soviet style five year plans. The First Five-Year Plan was to be the foundation upon which Nehru’s vision for the nation was to be built. It showed where Nehru and his supporters’ political will lay. Investment went into building and buying industry from the private sector.¹⁷⁹ India’s Second and Third Five-Year Plans set out to create the industrial core from which all of India’s development would spring. It closely regulated foreign trade and investment. Following the principle laid out by Nehru, the original plans paid little attention to the defense and small industry, consumer goods, or agriculture. According to V. Bhatt,

Nehru’s strategy was large scale industrialization with emphasis on capital and heavy industry. Cottage industry was to be tolerated with a view to provide employment in the short run, but the main objective was to develop large-scale modern industries and techniques that would supplant the traditional sector. The dominant sector was to be the modern sector, based on modern science and technology.¹⁸⁰

India’s five year plans created major obstacles for the defense industry. With the lengthy development time required for advanced weapon planning, the five year plans were problematic. The procurement process from concept, design, and production

¹⁷⁸ Malenbaum, “Costs,” 396 and 394.

¹⁷⁹ Rosen, “Planned,” 63.

¹⁸⁰ Bhatt, “Development,” 85.

of advanced weapons is much longer than five years.¹⁸¹ Eventually they adapted to the five year plan by rolling the projects through multiple plans, as they did in the case of broader industrial development. In China and the Soviet Union, the five year plans could be pushed through with little concern for the masses. In India, on the other hand, the five year plans were subject to reevaluation because of the democratic setting.

Although these objectives of these plans were grand, the implementation of the five year plans met several obstacles. One was of threat to leadership as different groups vied to stay or gain power. Global economic problems also shadowed the five year plans. The impact of these problems highlighted the need for reforms in the 1960s. However bad timing and poor implementation “discredited [the reforms], and continued reforms were considered politically threatening.”¹⁸² In agriculture, however, the reforms were successful and created a Green Revolution. In fact, their success created a setting which required more resources to be poured into the agriculture sector further affecting the defense budget.

b. *Impact of the Great Depression and Colonialism on Nehru's Policies*

Nehru's goals were lofty and his influence can be seen in the policies he crafted. The Great Depression and colonialization fears influence Nehru to push for self reliance but there was a conflict in his goals. Though he wanted to achieve economic and social equality, shortage of resources and political capital among the elite hampered this objective. The economic and industrial development policies had greater political capital than social equality because of the make up of the INC. The elites used their political capital to push more resource to industrial development over social equality for their own benefit. Also there was a fear that the lack of industry might make India dependant on other nations. Priority for achieving social equality was overshadowed by the fear of colonialism and exploitation by foreign powers. The defense industry received even lesser attention.

Another objective of self reliance was to prevent dependence upon foreign powers. To prevent dependency, heavy industry was a prerequisite. Raju Thomas writes,

¹⁸¹ Raju G. C. Thomas, *Indian Security Policy* (Princeton, N.J.: Princeton University Press, 1986), 200.

¹⁸² Rosen, “Planned,” 66.

“The 1956 Industrial Policy Resolution, in particular, clearly outlined a policy that was fundamentally socialist. It envisaged progressive state control and ownership of almost all major industries in the long run.”¹⁸³ The strategy was similar to other developing countries after World War II, which adopted centralized planning, control of major industries, and a focus on heavy industry. Nehru’s socialist inspired quest for industrialization led to the conversion of most defense industries in India to SOEs.¹⁸⁴ Poor funding and oversight of the defense industries later led to inefficiencies which could have been resolved by better management and focus on the defense industry, but once again that was not Nehru’s priority. When there was a focus and clear oversight as there was with nuclear weapons, the industry did well. In the rest of the industry, there was an indifference that led to inefficiencies and problems.¹⁸⁵

c. *Nehru’s Dislike of the Military*

The defense industry and military had a number of factors affecting its political capital but the greatest factor I would argue that influenced its ability to garner adequate resources was Nehru’s dislike for the sector. Marwah writes, “There was an element of estrangement between the two. In the nationalist perception, the military in the past had discharged the functions of an ‘army of occupation’ in India.”¹⁸⁶ In addition to Nehru’s genuine disgust at what that military stood for, a disgust he arguably inherited from Mohandas Gandhi, the military’s domination in a coup in Pakistan also heightened his insecurities of the military. These factors all in combination lowered the political capital of not only the Indian military but the defense industry over all. According to Cohen,

Believing, too, that the Indian Army had been a tool for the Raj, and thus was not to be trusted, Nehru not surprisingly focused most of India’s postwar energies on building state power, but not state military power. He took seriously his own statements about the priority of internal economic development, so defense budgets remained stagnant.¹⁸⁷

¹⁸³ Thomas, *Security*, 203.

¹⁸⁴ Mohammed Ahmedullah, “India’s New Defence Procurement Procedures and Offsets Policy,” *Military Technology* 30, no. 2 (2006): 22.

¹⁸⁵ Smith, *Ad Hoc*, 222.

¹⁸⁶ Marwah, “Power and Policy,” 108.

¹⁸⁷ Cohen, *Emerging*, 128.

In addition to Nehru's genuine dislike for the military and its purpose, he and the INC thought defense spending would hurt economic growth.¹⁸⁸ Like China under Deng, it was economic development first before the defense industry. The leadership in both the countries felt that defense industry would be furthered by the development and prosperity of the private sector. Therefore the defense industry had very little political capital to influence political will to obtain resources.

Though Stephen Cohen writes, "Indian defense planning was virtually nonexistent, an afterthought, once the Soviet-inspired five-year plans were implemented,"¹⁸⁹ it was not totally ignored. There were some resources invested into the defense establishment. Although low in political capital, Nehru and his government were realistic in their perception of the world and knew they would require at least some ability to provide for defense. The capabilities, however, were purchased at the expense of developing indigenous capabilities to produce weapons.

C. DEVELOPMENTS IN DEFENSE INDUSTRY UNDER NEHRU

India's underfunded quest for an indigenous advanced arms industry resulted in continued failures, eventually convincing leaders that India could not get to where it wanted to be without assistance. Prior sections illustrated the lack of political capital for the defense sector combined with the shortage of resources undermined the industry. However, the failure to hold bureaucracy accountable for effective utilization of the resources also undermined the sector. Inflated expectations also put forth by the bureaucracy contributed to the poor development of the industry. The failures appeared to be worse when compared to the original plans and expectations making the military weary of the products and promises. Smith illustrates the problem with inflated expectations,

There appear to have been too many attempts to indigenize the defence sector when it is perfectly clear that the expertise and technology are unavailable at the national level. Furthermore, India decision makers have always tended to pitch requirements far higher than industry is capable of delivering.¹⁹⁰

¹⁸⁸ Cohen, *Emerging*, 128.

¹⁸⁹ Cohen, *Emerging*, 128.

¹⁹⁰ Smith, *Ad Hoc*, 177.

Because of failure to create an indigenous advanced arms industry, the decision was made to enhance the advanced arms industry by buying technology.¹⁹¹ Buying technology was to make incremental gains in the sectors the country was having troubles developing and assist in developing an expertise where it was lacking. But without the industrial base, India ended up purchasing weapons significantly rather than building them under license.

The neglect and low political will to spend resources on the defense industry can be seen by the minimal progress in all but one defense sector made under Nehru. The one defense sector not neglected by Nehru was the nuclear sector, which was started immediately after independence.¹⁹² Other than the nuclear industry, there was not much development in other sectors of the defense industry beyond small arms and ordinance until the middle of the 1950s.¹⁹³ (Dvir and Tishler's phase one) Even when Nehru was more inclined towards the development of the industry at the end of the 1950s, progress was slow and the industry did not progress much. Chris Smith's research into the industry found, that it "... actually amounted to very little. ... India's small industrial base and the scarcity of resources, including foreign exchange, limited actual productions and subsequent progress."¹⁹⁴ Until other factors would change, the defense industry just did not have the resources.

Another factor that harmed the development of the advanced arms industry during Nehru's tenure, in addition to defense planning being an "after thought," was a lack of a link between industry and research. Research was not used to help modernize existing industries and according to Bhatt, "... no appreciation of the role of technology research in upgrading traditional techniques, nor ... make original research to advance the frontiers of science and technological knowledge."¹⁹⁵ It was science for science sake only, not the application of science to industrialization to make it better or more efficient. As the stated in Chapter 2, "... investment made 10-25 years beforehand predominantly

¹⁹¹ Hilali, "Strategic," 751.

¹⁹² Cohen, *Emerging*, 158.

¹⁹³ Smith, *Ad Hoc*, 146.

¹⁹⁴ Ibid.

¹⁹⁵ Bhatt, "Development," 93.

determines military equipment quality.”¹⁹⁶ The mistake was critical, not only to the defense industry but to the civilian industry as well. It is not until the Fifth Five Year Plan that the problem was finally addressed and technological and scientific research was linked to industry development. The defense industry had little to no advanced capabilities in the late 1950s, and there was no research and development linked to defense until the Fifth Five Year Plan (1974). Add 10 to 25 years to the date of the Fifth Five Year Plan, and we have an explanation for India’s lack of production capabilities in the 1980s and 1990s.

1. International Security Threats Impact on the Defense Industry

Threats to India’s national security in the early 1960s shook the Indian civilian leaderships’ attitudes towards the defense industry. This external threat which came at first from China and then Pakistan, forced the state to divert much needed resources into the defense sector. As the threat perception caused by the China war increased and nuclear proliferation increased, so did the defense industries’ political capital. Up until then, India used to purchase weapons systems from developed nations. Cohen states,

It took growing tensions with China and the 1958 coup in Pakistan to persuade the government to reconsider its overall security policy ... There was a new emphasis on indigenous production and licensing, rather than the purchase of complete systems from foreign suppliers.¹⁹⁷

Without the basic infrastructure in place, it takes a while to increase indigenous production. Therefore, purchasing of weapon systems continued. In fact, as the threat increased, so did the political will to spend more on indigenous production. Meanwhile, the immediate conditions led to the purchase of weapons for immediate needs reducing the resources for indigenous development. After India was defeated by China and Nehru’s popularity saw a decline, the political capital of the defense industry skyrocketed. Yet, as a poor nation, India could not develop weapons and at the same time purchase them.

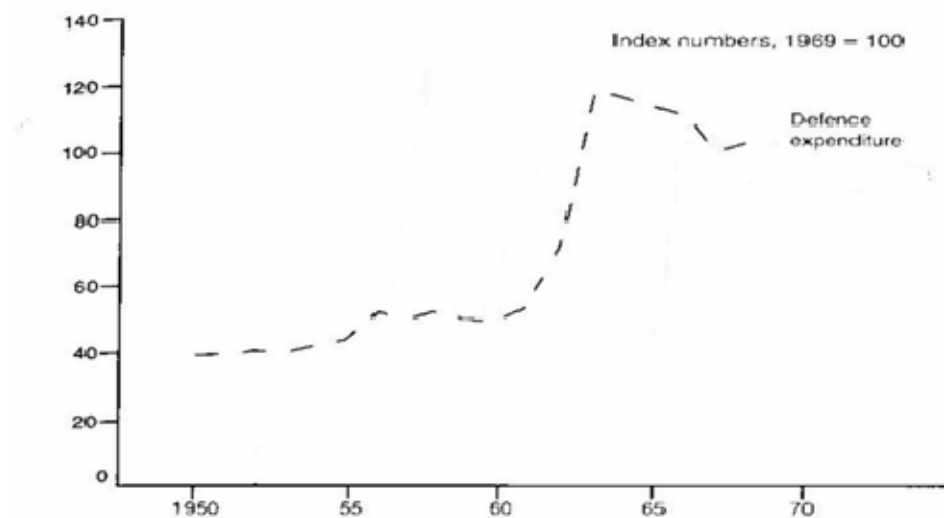
a. A War with China Gives a Boost to the Arms Industry

The concern over the loss to China was reflected by the fact that the defense budget nearly doubled the year after the war. (See Figure 1.) According to

¹⁹⁶ Middleton, “Effect,” 137.

¹⁹⁷ Cohen, *Emerging*, 129.

Marwah, “The earlier leisurely pace of development an armament industry was speeded up and its requirements formalized as high priority items within the general context of planned development.”¹⁹⁸ Without the ability to produce weapons to meet the immediate threat India started to purchase weapons to modernize the military at an increasing rate. The wholesale purchase of weapons pulled resources from indigenous research and development and production. “In the immediate aftermath of the war, India had appeared to abandon selectivity in the sources of its weapons supplies. Equipment came, in short term, from sources as contradictory as the United States, the Soviet Union, Britain, West Germany, Canada, and Yugoslavia.”¹⁹⁹



Source Chris Smith, *India's Ad Hoc Arsenal: Direction or Drift in Defence Policy?* (Oxford, NY: Oxford University Press, 1994), 71.

Figure 1. India's Defense Spending 1950 to 1970

2. Development of Nuclear Weapons Under

As mentioned earlier, nuclear research was the only sector of the defense industry that had sufficient political capital before the war with China. Whereas, the indigenous fighter industry was virtually nonexistent. The primary reason for the nuclear industries early success was Homi Bhabha, who was close to Nehru. According to Smith,

¹⁹⁸ Marwah, “Power and Policy,” 111-112.

¹⁹⁹ Ibid., 111.

Homi Bhabha, a brilliant scientist and the father of India's nuclear programme, used both his political power base, which stemmed from his pre-eminent position within the scientific bureaucracy during the 1960s, and his personal relationship with Nehru to advance the nuclear power programme and keep open the option to produce nuclear weapons.²⁰⁰

Second reason was the dual capability of nuclear research. While Nehru was against the military, the use of force, and nuclear weapons he did approve of the use of nuclear research for civilian purposes. Following the war with China, Nehru started to see that it might be advantageous to have the weapon as a defensive deterrence further enhancing the political capital for nuclear research.²⁰¹ Finally, nuclear capability could bring India prestige in the international community.

D. PROGRESS OF THE ADVANCED ARMS INDUSTRY AFTER THE DEATH OF NEHRU

After Nehru's death in 1964, it seemed like the defense industry would finally get the support it needed to develop thanks to change of leadership as well as increased threat perception. The increase in political will to fund the defense industry did happen but it was short lived. Cohen writes, "Although defense was a high priority for a time (1962-73), surpassing even development programs, Indians remain skeptical – or at least divided – about the virtues of military power."²⁰² The reasons for the defense industries drop in political capital were numerous: impending famine, democratic demand, economic downturns, sanctions, and the Soviets.

1. Influences of Democracy on the Arms Industry

Early in the post-war period, it was Nehru, the INC, and the elite priorities that shaped the political will. With India's independence came great expectations, not only from the elite but from the masses as well. The expectations shaped the use of resources in the country. Since poor peasants made up 80 percent of the population, logic would dictate that in a democracy they would have a greater voice.²⁰³ Initially, the majority of the population did not have a greater voice because elites controlled the INC and pushed back on Nehru's social reforms. As India and its democracy grew, however, the poor

²⁰⁰ Smith, *Ad Hoc*, 180.

²⁰¹ *Ibid.*, 179.

²⁰² Cohen, *Emerging*, 154.

²⁰³ Ashutosh Varshney, "Why Haven't Poor Democracies Eliminated Poverty?" in *India and the Politics of Developing Countries*, ed. Ashutosh Varshney (Sage Publications Pvt. Ltd, 2004), 207.

masses began to mobilize for various reasons to use their power to vote. The mobilization shifted the power from the elite to the masses as a democracy intends.

Not unique to India, the need of political groups to pander to the masses and elites for votes influences the government's objectives. What may be good for long term development of a democratic third world nation may not have popular or elite support. In other words, it may not have the political capital needed for implementation. In India, the leaders in power "... lacked the political will to resolve the problems of poverty and socioeconomic structural imbalance ... [they are] committed to doing as much as it can to resolve the poverty problem but without rocking the boat."²⁰⁴ The fear of "rocking the boat" affected India's ability to develop an advanced defense industry.

a. Impact of Green Revolution on Resource Management

As a result of having to purchase food from the United States to avert a famine in the mid 1960s, the Indian government instituted a new policy to increase food production. The government poured money into the countryside to help the small farmers produce better crops. They received free seed, fertilizer, and subsidies which led to increased food production. The success of this program created a class of small prosperous farmers which demanded political representation and began to assert themselves at the national level.²⁰⁵ With economic advancement comes social advancement because money facilitates education and mobilization. According to Thomas Simons,

As more and more people and groups enter 'the system,' they develop stakes in the system. They awaken to new hopes of gaining, to new fears of losing. They have new means-technical and conceptual as well as economic-to mobilize for action to advance those hopes and/or to allay those fears.²⁰⁶

The farmers rising political power influenced the state to shift its resources to gain the support of the lower classes. Meanwhile, the indigenous defense industry,

²⁰⁴ Tremblay, "Growth," 88.

²⁰⁵ Ashutosh Varshney, *Democracy, Development, and the Countryside: Urban-Rural Struggles in India* (Cambridge, UK: Cambridge University Press 1995), Chapter 4.

²⁰⁶ Thomas W. Simons, Jr., "Thoughts on the Current Crisis," in *South Asia in 2020: Future Strategic Balances and Alliances*, ed. Michael R. Chambers (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2002), 28.

barring the nuclear program, however, saw a decline in its resources as the state changed its focus to accommodate political change in the country. Thomas in his review of India's defense budgets found,

... after an initial high of 4.5% in the post-China war budget of 1963, ... the overall allocation to the Ministry of Defence has been lowered to about 3% of the GNP since 1973, there has also been a relatively budgetary decline in the share of all three Services. Defense problems in the mid 1970s appeared to command much less public attention than domestic political issues.²⁰⁷

The shift was also reflected in the leadership which was initially dominated by the upper classes/caste, but in rich agriculture areas were gradually replaced by the lower classes/castes.²⁰⁸ The shift caused urban professionals, small businesses, and urban areas to become marginalized due to loss of political influence. The shift and marginalization of different classes caused fragmentation of the INC and gave rise to other smaller parties. Fragmentation helped Bharatiya Janata Party (BJP), to come to power which till then had been limited to the northern region of the country.²⁰⁹ The increase farmer strength at the local levels led to fragmented vote banks in different regions. "India's elections increasingly revolve around local or regional concerns and power dynamics between social groups."²¹⁰ Where no parties are strong enough to gain outright control, lead to the formation of coalition governments in India.²¹¹ For national parties such as INC or BJP to form a government, they need to partner with smaller parties in coalition to gain a majority.²¹²

Coalition building creates an even greater need to please different demographics for votes. In fact, it overemphasizes minority or small groups because

²⁰⁷ Raju G. C. Thomas, "The Armed Services and the Indian Defense Budget," *Asian Survey* 20, no. 3 (1980): 282-283.

²⁰⁸ Varshney, *Democracy*, 192.

²⁰⁹ Pradeep Chhibber, "Who Voted for the Bharatiya Janata Party?" *British Journal of Political Science* 27, no. 4 (1997): 638-639.

²¹⁰ Teresita C. Schaffer, "A Changing India," in *South Asia in 2020: Future Strategic Balances and Alliances*, ed. Michael R. Chambers (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2002), 39.

²¹¹ Ashutosh Varshney, "Mass Politics or Elite Politics," in *India's in the Era of Economic Reforms*, ed. Jeffrey Sachs, Ashutosh Varshney, and Nirupam Bajpai (New Delhi: Oxford, 1999), 242.

²¹² Baldev Raj Nayar, "BJP's Economic Nationalism," in *Indian and the Politics of Developing Countries*, ed. Ashutosh Varshney (Sage Publications Pvt. Ltd, 2004), 229.

larger parties try to gain favor with them to acquire a majority. Coalitions allow groups to consolidate political capital to gain resources for their causes. Forming coalitions and trying to please voters squeezed resources and pulled it from all but the nuclear program in the defense industry. Other sectors did not have the political capital the farmers had, especially the defense sector which only gets political capital at the time of threat. Pandering is illustrated by the INC's attempt to cut farm subsidies. As the farmer's numbers and influence grew so did farm subsidies to the point where they were at "astronomical levels."²¹³ The farmers have so much political capital that trying to reign in farm subsidies was political suicide for an Indian politician or political party. When India faced a fiscal crisis in the 1980s, the government tried to cut subsidies creating a political fire storm which threatened to topple the government. The poor and the farmers' uproar caused politicians to reverse their decision on cutting subsidies. Demonstrating how truly democratic India is, the people voted out the INC that implemented the short lived subsidy cuts. With a coalition government, the opposition BJP was able to take power the 1998 election.

2. Dependency on the Soviet Union

Even when there is an external threat that increases the political capital of the defense industry it cannot instantly succeed over night. When a threat does exist, the indigenous arms industry cannot produce or supply weapons the military needs immediately. The lack of capability leads to purchasing or licensing of weapons that take resources from indigenous development. Amit Gupta writing about India's arms industry states,

The Indian government decided to turn to the Soviet Union for arms supplies in 1962, through the purchase of MiG-21s, because it wanted to acquire the necessary technology to produce such system. ... Since the signing of the MiG deal in 1962, the Soviet Union has become India's principal supplier of weaponry.²¹⁴

The Soviets took a dramatic step to bind India to them for decades to come by granting licenses to build Soviet weapons systems and deceptive low prices. Licensing was common among Western allies, but not common for the Soviet Union. In fact, at the

²¹³ Varshney, "Mass Politics," 242.

²¹⁴ Gupta, "Lumbering," 855.

time India was the only country outside the Soviet Union that was allowed to produce major advanced Soviet weapons systems under license.²¹⁵ The Soviet Union offered a multitude of weapons systems for all branches of India's armed forces. India used Soviet systems as a core upon which to build its troubled industry creating a dependency that hurt India in the long run. According to Ramesh Thakur, the dependency was created because advanced Soviet weapon systems "enjoyed significant price advantages over comparable Western equipment ... [and unlike western technology] had a tendency to cumulate development, so that license production facilities could be upgraded to manufacture systems that were compatible with earlier generations."²¹⁶

From the 1960s to the early 1980s India was dependent on the Soviet Union for direct purchases and license production (phase two) to meet its military needs and help its indigenous arms production.²¹⁷ According to Gupta, by the early 1970s "close to 40% of the [Indian] Air Force's inventory consisted of Soviet aircraft"²¹⁸ and by 1995 the continued dependency resulted in "approximately 70% of India's defense equipment is of Soviet origin."²¹⁹ The dependency derived from the on and off relationship with the United States but more importantly the favorable financing offered by the Soviet Union.²²⁰ Because Nehru and the INC had not invested in indigenous production they had to purchase when the threat increased. Once again purchasing pulled money away from the defense industrial development. The lack of development snow balled. Deba Mohanty writes, the dependency "... caused a gap of nearly three decades in India's effort toward indigenous production."²²¹ As the security needs increased, they had to purchase more and pull more away from indigenous development.

The politicians and bureaucracy allowed India to become too dependant on what was initially perceived as cheap purchase of weapons systems over development of their

²¹⁵ Robert M Cutler, Laure Despres, and Aaron Karp, "The Political Economy of East-South Military Transfers," *International Studies Quarterly* 31, no. 3 (1987): 277.; Thakur, "Impact," 832.

²¹⁶ Thakur, "Impact," 833.

²¹⁷ Hilali, "Strategic," 749.; Mohanty, "March," 39.

²¹⁸ Gupta, "Determining," 445-446.

²¹⁹ *Ibid.*, 456.

²²⁰ Smith, *Ad Hoc*, 127.

²²¹ Mohanty, "March," 39.

own indigenous industry. The dependency increased because the initial low cost for Soviet weapons did not include the high cost of maintaining the equipment, pulling even more resources from indigenous development.²²² The choice to develop an advanced arms industry was not as strong as the political will to trade with the Soviet Union for cheap imports, kickbacks, and an export market for India's agriculture products. Smith writes,

On the one hand there was a growing awareness of and concern about dependency. ... On the other hand, New Delhi had nowhere else to go for defence equipment during a time when the mounting bill for food grains, fertilizers, oil and steel had virtually wiped out the country's foreign exchange reserves.²²³

Another reason the industry continued down the road of substandard performance is because there is no political will to fix the problems of the industry. For some of India's politicians it was in their best interest to keep the ineffective status quo because of kickbacks they received for themselves and their political party.²²⁴ Corruption allegations and the fact that kickbacks influence defense acquisition is common knowledge.²²⁵

The bureaucratic pull towards continued purchasing and licensing of products contributed to the failure of the development of indigenous advanced arms industry. However given the security context and the lack of indigenous production capabilities the original decision to purchase and license weapons is understandable. However, cheap weapons decreased the desire to develop a domestic weapons capability.²²⁶ Even when it became clear it was detrimental to their ultimate goal of self sufficiency (phase four), the government, Ministry of Defense, and the military continued down the road of dependence staying in phases two and three of development. Mohanty writes, the dependence on the Soviet Union "... unavoidably led to two problems – below par quality performance of the defence industry ... and insufficient funding for the critical

²²² Thakur, "Impact," 834.

²²³ Smith, *Ad Hoc*, 96.

²²⁴ Gupta, "Lumbering," 861.

²²⁵ Smith, *Ad Hoc*, 218.

²²⁶ Cohen, *Emerging*, 143.

sectors of the defence industry including most notably its R&D effort.”²²⁷ Buying or licensing from predominantly Soviet Union and at times from the British and French created an easier route to get advanced weapons. Bureaucratic short sightedness and the choice to seek routes that achieve instant gratification, ignoring or not consider the consequences of such decisions, hurt the development of a domestic arms industry in India.

3. Break Up of Soviet Union and its Effects on the Indian Arms Industry

Just before the fall of the Soviet Union, 1980-1990s, India faces its second major economic crisis as its currency fell against other nations’ currencies. Vijay Kelkar states, “By 1991-92 the outstanding liabilities of the central government exceeded 69 percent of GDP. The interest payments on the public debt represented nearly 70 percent of the center’s fiscal deficit.”²²⁸ At the same time, developed nation’s weapons became more technologically advanced and expensive.²²⁹ When India was least able to afford weapons, the price of advanced arms skyrocketed. Soviet Union was willing to make deals for equipment that did not require payments in hard currency. India and the Soviet Union had a Rupee trade agreement that did not require hard currency.²³⁰ When Soviet Union collapsed it further compounded India’s financial and arms development crisis.

First, the dependency, a mentioned before, hindered the development of India’s arms industry and was therefore unable to fill the void. Second, the fall of the Soviet Union cut off their supply of weapons. Since the Soviets spread production of weapons throughout the Union, which were now separate countries, India had to track down who supplied what weapons or parts to a system. To make matters worse, the new cash strapped Republics that used to make up the Soviet Union wanted hard currency. Currency India did not have because of the economic crisis. India had to renegotiate with the individual republics that now owned the different weapons sectors. As a result, India started to discuss privatizing their arms industry.

²²⁷ Mohanty, “March,” 39.

²²⁸ Vijay L. Kelkar, “South Asia in 2020: Economic Outlook,” in *South Asia in 2020: Future Strategic Balances and Alliances*, ed. Michael R. Chambers (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2002) 77.

²²⁹ Smith, *Ad Hoc*, 146.

²³⁰ Thakur, “Impact,” 834-835.

4. Private Industry and Foreign Direct Investment (FDI)

India's state-owned defense industry is facing the same problems as other nation's defense industries.²³¹ Like China, India's private sector fears involvement in the state-owned defense sector because they see it as too risky and expensive. According to *Jane's*, India's civilian industry is also "... wary of dealing with an 'unbending and bureaucratic' MoD, [they are] also circumspect about insufficient orders which would make any participation commercially untenable since big financial outlays were required for defence R&D and production."²³² By remaining state owned, the industry is not forced to show short run results like the private sector. In fact, Indian acquisition officials confess they are "clueless" in commercial acquisitions.²³³ The government run defense industry is so out of touch with the realities of the civilian industry it has been described by James Clad as working "within a closed circle, twirling on its own axis and indifferent to the rest of the economy."²³⁴ In 2001, realizing India's private sector is not able or willing to help the beleaguered state-owned defense industry, India changed its policy to allow more direct foreign investment, up to 26 percent, of its defense industry.²³⁵

5. Bureaucracy

The Indian bureaucracy adds to the drain on the limited resources allocated for the advanced arms industry. The Indian bureaucracy uses these resources ineffectively and directs too little to research and development. The Parliamentary Standing Committee on Defense supports the assertion. Similar to the problems facing China, they have found the defense industry spreads the research and development funds over too many projects, resulting in a poor end product.²³⁶ For example, the organization will fund pet projects that will get voter or political support, of which only nuclear program has seen success. The committee states that the failure to "... adequately focus on vital costs and scope ... caused numerous changes in the programs' General Staff Qualitative Requirement (GSQR) leading to delays and import of expensive components which drained scarce

²³¹ See Chapter II of this thesis

²³² *Jane's* "Indian Defence Industry." <http://www2.janes.com>. (accessed August 1, 2005)

²³³ Sandeep Unnithan, "The New Arms Code," *India Today* Jun. 27, 2005, 65.

²³⁴ Clad, "India," 47.

²³⁵ Mohanty, "March," 35.

²³⁶ *Jane's* "Indian Defence."

foreign exchange reserves.”²³⁷ Also, “don’t rock the boat” mentality makes reform of the system difficult because of the risk of losing office. These delays not only cause a drain on resources, but support the military’s complaints about delivery of Indian weapons. India’s military’s confidence in her advanced arms industry is low. They say it has produced “little [of] worth since its inception in 1958.”²³⁸

Defense Research and Development Organization officials, in turn, accuse the military of imperiling projects by making “unrealistic” demands and requirements that change constantly.”²³⁹ Both are correct. The Defense Research and Development Organization failed in its oversight of development projects. The military failed to give clear well thought out requirements and continues to make changes to project after they have started. It is just in 2004 that the Ministry of Defense finally implemented new clearer guidelines. India’s military continues to hesitate in dealing with India’s arms industry because of their poor record of delivery. The bureaucratic bumbling and lack of oversight of India’s acquisition and procurement is summed up best by Unnithan. He states,

The process of buying arms is so opaque and beset by delays-it has been described as the fiercest enemy of the armed forces itself. They say these delays caused far greater concern than kickbacks because they severely affect defence preparedness and the ongoing modernization drive ... ‘Our procedures are so convoluted. If they are dutifully followed, nothing can be procured within any time frame,’ says a senior defense official. ‘It takes one year to get a simple yes from the government. By then it is time to surrender our budgetary allocation to the Finance Ministry because we haven’t bought the weapon system.’²⁴⁰

The disjointed acquisition process is exemplified by a 2000 purchase made by all three services. The Indian Army, Navy, and Air Force bought the same UAV from the same Israeli company and each paid a different price. Yet, there is no plan to fix the problems for reasons outlined above.

²³⁷ Jane’s “Indian Defence.”

²³⁸ Ibid.

²³⁹ Ibid.

²⁴⁰ Unnithan, “Code,” 65.

E. DEVELOPMENT OF FIGHTERS IN POST NEHRU PERIOD

The indigenous fighter industry has never been a pressing priority for the politicians or military in India. In 2005, the Former Commander in Chief of the Indian Air Force Training Command, Air Marshal Pandey, said "... the Indian aerospace industry does not as yet have the technological strength to meet this requirement on its own, the nation has no option but to turn to the international market."²⁴¹ In addition to the lack of support from political leaders, the military also does not have the political will to support the indigenous fighter industry. The armed forces prefer foreign fighters, especially western systems, to those developed indigenously.²⁴²

The attempts to build a fully indigenous fighter has been a continuous failure. The first attempt to build an indigenous fighter, the HF-24 Marut, was in the late 1960s and it failed.²⁴³ It came at a time when the increased security threat provided the industry with some resources, yet, it failed because India tried to develop it before it had the technical capabilities. Thomas Graham writes, "Marut relied on imported parts and materials and was more expensive to produce in India than it would have been to import a complete plane. The plane was technically obsolete by the time it was first delivered in 1964."²⁴⁴

Without the capability to produce their own fighters, India is successfully licensing production of foreign weapons (phase two). They are also successful at upgrading licensed weapons (phase three). However, the licensing hurts indigenous fighter production and the industry as a whole because it drains limited resources. Smith's investigation into India's arms industry reveals, "Indigenous production of the MiG-21 series was an expensive venture for India. The cost of producing the MiG-21 in India was 193 percent more than its imported cost."²⁴⁵ Outright purchasing would have

²⁴¹ B. K. Pamdeu, "Selection of MRCA for the IAF," *Bharat Rakshak, The Consortium of Indian Military Websites*. <http://www.bharat-rakshak.com/SRR/Volume13/pandey.html> (accessed November 15, 2006)

²⁴² Smith, *Ad Hoc*, 177.

²⁴³ *Ibid.*, 160.

²⁴⁴ Thomas Graham, "India," in *Arms Production in Developing Countries*, ed. James Everett Katz (Lexington, MA: Lexington Books, 1984), 170.; Found in Gupta, "Lumbering," 849.

²⁴⁵ Smith, *Ad Hoc*, 158.

been cheaper than building licensed weapons. However, purchasing would not have given the experience of building weapons which created a catch 22.

The latest venture of the development of an indigenous fighter is the Light Combat Aircraft (LCA). Though under development since 1983, it is still not operational and its projected service date is continuously postponed. The current projection for the LCA to go into service is 2010.²⁴⁶ Even after 24 years of development, India will still require foreign help with the engines.²⁴⁷

F. CONCLUSION

This chapter evaluated the reasons behind the slow development of India's indigenous advanced arms industry as a whole. Only certain small sectors have seen success. Smith writes, "Many of the claims that systems are 'indigenous' are in fact misrepresentations, as increasingly the term is used to cover production which involves little more than assembly."²⁴⁸ The creation of a wholly indigenous advanced arms industry in India failed for a number of reasons. I contend it is now too costly for nations to develop advanced weapons alone and it is too late for nations not already possessing a fully indigenous advanced arms industry to build one.

India is clearly not making the most of what it has because it possesses the technicians, scientist, and infrastructure to develop technologies to make India's advanced arms industry more self sufficient than it is. India's "efforts have been dogged by delays, price increases and bureaucratic-political wrangling far beyond what has come to be expected as normal."²⁴⁹ One reason for the failures is "the constraints of democratic politics"²⁵⁰ shaping the allocation of resources in the early phases of development. Political parties and their leaders focused on policies to get votes from the masses. Defense only received increased resources if it was framed into a political issue as nuclear program was.

²⁴⁶ *Defense Industry Daily*, "India: LCA Tejas by 2010 – But Foreign Help Sought With Engine." <http://www.defenseindustrydaily.com/2006/02/india-lca-tejas-by-2010-but-foreign-help-sought-with-engine/index.php> (accessed February 21, 2006)

²⁴⁷ *Ibid.*

²⁴⁸ Smith, *Ad Hoc*, 147.

²⁴⁹ Jane's "Indian Defence."

²⁵⁰ Tremblay, "Growth," 96.

Second, India has partnered with countries that will share technologies they need through licensing. Licensing creates a dependency that drains the will and resources to build an indigenous advanced arms industry and has frozen them into phase two and three of defense development. Instead of using licensing as a means to increase their indigenous capability they have allowed it to overshadow indigenous production. However, it does not have a choice in order to keep up its advanced arms supplies which brings me to my point about how it will be difficult for developing nations to spend resources on both development of advanced resources as well as purchase. Third, indigenous production is hurt because India's research and development is under funded. There is a lack of political will to prioritize the research and development. They spread money over too many projects and have a dysfunctional procurement process.

The political will of India's leaders in the first 50 years of its existence was not the development of an indigenous advanced arms industry but economic development. Where there were external sources available, India took the path that made them over dependant on those outside sources to the detriment of its indigenous sources. Gupta states, "In situations where the pressure to attain self-sufficiency has been high, the Indian scientific establishment has been able to deliver the goods."²⁵¹ India is now entering a new phase of industrial arms development, a phase of joint development. India, unlike China, may have finally gotten it right. Joint development, unlike licensing, should actually help develop India's advanced arms industry by developing its infrastructure and technicians while not taking money from research and development. In fact joint development should put money into India's research and development. Joint development if managed properly will pay off big for India and further its goal of becoming a regional power on the Indian subcontinent.

²⁵¹ Gupta, "Lumbering," 856.

V. CONCLUSION

Using China and India as case studies, my thesis investigates the feasibility of developing nations' ability to create a wholly indigenous advanced arms industry. No developing nations including China and India, have a fully domestic advanced arms industry. Given current strategies, countries that try to develop the entire industry will have extreme difficulty. Both authoritarian and democratic countries have constituents that must be appeased to remain in power. Scarce resources are spread thin in the nation building process leaving an inadequate amount to fully develop the defense industry. By concentrating resources there are, however, a number of developing nations who have successfully developed specific sectors of their defense industry. More specifically, strategic weapon sectors such as nuclear weapons and missiles are chosen for resource allocations because they bring international prestige and deterrence as well as have civilian applicability.

The development of a fully indigenous arms industry is not a realistic option for a developing nation given the circumstances. The current context of the globalized arms industry and the prohibitive costs of building advanced weapons are causing developed nations to rethink their strategy for building and acquiring advanced weapons. Bharat Verma supports my assertion when he writes,

No single vendor or country has the resources to invest individually to attain self-sufficiency in creating weapon platforms of the next generation. The future well being of nations will depend on their integrating their armament industries effectively between countries with shared perceptions of their national interests by creating joint ventures.²⁵²

More and more nations, developed or undeveloped, are moving towards joint development.

Few nations now have the capability to develop and build advanced systems alone. To have modern military capabilities, less developed nations have a choice to continue to strive for self sufficiency, buy weapons, licensing production of weapons, or pursue joint development of weapon systems. Self sufficiency will most likely fail and

²⁵² Bharat Verma, "Military Industrial Complex: Crafting a Winning Strategy," *Bharat Rakshak, The Consortium of Indian Military Websites*. <http://www.bharat-rakshak.com/SRR/Volume12/bharat.html> (accessed June 13, 2006)

waste resources which are limited for developing nations. Buying and licensing does not lead to significant technology transfer and creates dependency. Dependency allows other nations to have undue influence over one's internal affairs.²⁵³ Joint development may still allow undue influence but at a lesser level because it produces a codependency. In his research, Richard Bitzinger shows joint development is on the rise. He says, "While the licensed production of Western or Russian weapons remains the major mode of arms manufacturing in these countries [developing nations], codevelopment and coproduction programs between developing and industrialized nations are gradually increasing."²⁵⁴ (See Figure 2.)

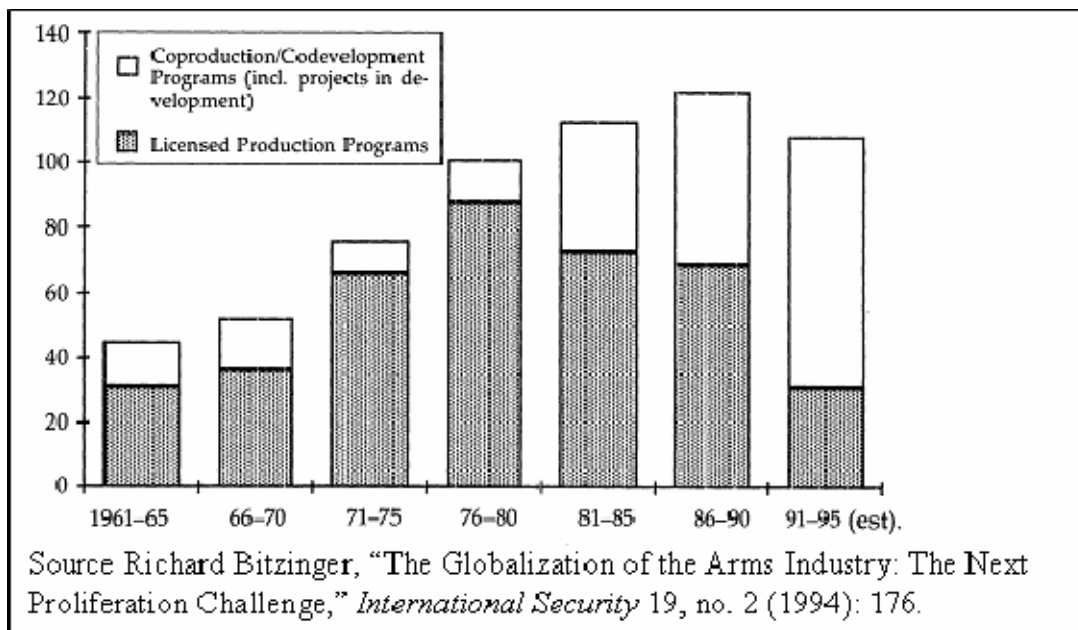


Figure 2. Licensed and Joint Development (Codevelopment) 1961-1995

My theory has important implications for the United States foreign policy formation. Although both India and China continue to build Russian aircraft, the fact that China must still fly them back to Russia for major repairs is a sign of weakness that may be exploited. The United States needs to know where India and China fall on the

²⁵³ Theodore H. Moran, "The Globalization of America's Defense Industries: Managing the Threat of Foreign Dependence," *International Security* 15, no. 1 (1990): 57-99.

²⁵⁴ Bitzinger, "Challenge," 186.

dependence scale. Knowing the amount of influence the United States may bring to bear, directly or indirectly, upon China and India will allow Washington to influence the two nations to conform to United States' overall policy objectives. Both China and India realize dependency is a problem and have faced it in the past, the Chinese with the Soviets and the Indians with the United States. However neither chooses to commit the resources to develop their advanced arms industry at the expense of the economic development and political pressure. Also detrimental to their indigenous development of an arms industry is the fact that both China and India continue to be the largest importers of advanced weapons in the developing world.

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