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14. ABSTRACT This paper explores the historical success of the industrial base during World War II and provides an overview of the factors that have led to the current state of the U.S. industrial base. The U.S. capital markets are considered the most robust in the world, with a deep and diverse pool of capital providers and high liquidity. Implementing modified forms of inventory financing through Defense Production Act Authorities can encourage industry to rebuild manufacturing capabilities to address future challenges. Additionally, the issuance of debt securities targeting industrial base production can increase capacity while also counteracting inflationary pressures. By tapping into the strengths of its financial markets, the United States can build a resilient industrial base that supports its economic interests while strengthening national security and deterring aggression.					
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NAVAL WAR COLLEGE

Newport, RI



***Investing in America's Defense:  
Using Innovative Financial Tools to Build and Strengthen the Industrial Base***

**NAVAL WAR COLLEGE ESSAY COMPETITION FOR AY 2022-23:  
Mr. B. Franklin Reinauer II Defense Economics Prize**

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During a recent panel at the Reagan National Defense Forum, Lockheed Martin CEO Jim Taiclet commented, “The United States defense industrial base is scoped for maximum efficiency in peacetime production rates” (Reagan Foundation). The shortfall in production becomes starkly apparent when viewing the timeline to restock munitions the United States Department of Defense provided Ukraine. Within a year of Russia’s invasion of Ukraine, the Ukrainian military consumed more Stinger anti-air missiles than Raytheon Corporation makes in 13 years, as well as five years’ worth of Javelin anti-tank missiles. At this point, most war strategists agree that the United States needs to increase production to rebuild their stockpile of munitions and reconfigure manufacturing capacity to meet the demands of future conflict. This is much easier said than done and requires immediate action.

This paper explores the historical success of the industrial base during World War II and provides an overview of the factors that have led to the current state of the U.S. industrial base. Fortunately, there is hope. The U.S. capital markets are considered the most robust in the world, with a deep and diverse pool of capital providers and high liquidity. Implementing modified forms of inventory financing through Defense Production Act Authorities can encourage industry to rebuild manufacturing capabilities to address future challenges. Additionally, the issuance of debt securities targeting industrial base production can increase capacity while also counteracting inflationary pressures. By tapping into the strengths of its financial markets, the United States can build a resilient industrial base that supports its economic interests while strengthening national security and deterring aggression.

### **World War II – The Ultimate Case Study in Industrial Base Mobilization**

World War II is often cited by economists and historians as a prime example of swiftly redirecting industrial manufacturing capabilities to achieve wartime success. The United States’

ability to outproduce its Axis rivals was a significant factor in Allied victory. Throughout that war, the Department of Defense was able to produce, “86,000 tanks, 2.5 million trucks and half million jeeps, 286,000 warplanes, 8,800 naval vessels, 5,600 merchant ships, 434 million tons of steel, 2.6 million machine guns, and 41 billion rounds of ammunition” (Herman ix). In his book *Freedom’s Forge, How American Business Produced Victory in World War II*, historian Arthur Herman describes the unprecedented build-up and observes how many of the challenges faced in the 1940s are still relevant today, namely, how to incentivize industry to support the mobilization effort. In 1940, President Roosevelt called on former automotive executive William Knudsen to serve as Chairman of the Office of Production Management to oversee wartime manufacturing. Having spent his career in industry, Knudsen understood the financial goals of companies and implemented incentive structures that encouraged businesses to “take risks on manufacturing things that had no commercial value to them but were crucial to the defense effort” (Herman 92). Knudsen encouraged acquisition contracting reforms such as shortening the amortization schedule and providing letters of intent prior to contracting to allow companies to obtain working capital financing.

Knudsen’s early success in mobilizing the industrial base led to unprecedented production rates that supported the Allied forces in multiple theaters. As Herman observes, “America was indeed in production now, with 25,000 prime contractors and 120,000 subcontractors making products they had never dreamed of making, and thousands more to come. And nothing the people in Washington or the Axis could do now would stem the tide” (Herman 118). In the Pacific theater, the United States’ ability to surge production and rapidly replace losses allowed the Allies to out-produce Japan and overcome early setbacks. In the Atlantic, the Allies’ success was due to the production of Liberty ships and the sheer number of

weapons and ammunition produced. By Herman's estimate, World War II "created more than half a million new businesses, while thousands of existing businesses boomed supplying orders [for the defense prime contractors]" (Herman 118-19).

The defense industrial base of today is only a fraction of what it was during World War II, but it can still achieve similar outcomes if provided with appropriate incentives. To understand these incentives, it is essential to look back at the history of the post-World War II era and examine the factors that brought about the present state of the industrial base.

### **Globalization – Reconfiguring the Global Economy**

Following World War II, the United States played a significant role in stabilizing the global economy by creating institutions like the World Bank and the International Monetary Fund. The primary aim of these organizations was to provide financial support to countries for the growth and development of industries within their borders. The global leaders also recognized that creating an environment that promotes the free flow of goods would reduce the likelihood of another global conflict due to interdependence between competing nations.

As a result, in 1947 23 countries signed the General Agreement on Tariffs and Trade, or GATT, which aimed to reduce or completely eliminate trade barriers, thus promoting international trade. The GATT framework provided a strong foundation for the formation of the World Trade Organization (WTO) in 1995. The WTO is an organization that regulates global trade by enforcing international agreements and resolving disputes between member countries.

The vast majority of economists agree that global trade has been beneficial to the economy due to the reduction of overall costs of goods, increased technology transfer, and an overall increase in productivity and growth. As Scott Lincicome, a trade economist, has pointed out, American consumers have benefitted greatly from access to a wide variety of new goods and

services at lower prices. Various studies have shown that low-cost imports over the past two decades, many from China, have resulted in "hundreds of thousands of dollars in consumer benefits" for American citizens (Lincicome). Creating trade relationships also lessens the risk of conflict between nations due to the economic costs associated with decoupling.

However, the benefits of changes in supply chains is not uniform across industries, and while low-wage consumers benefit from manufacturing in low-cost countries, there has been a reduction in American domestic manufacturing capacity since the mid-1940s that is partly attributed to globalization. While globalization is not the sole factor responsible for this trend, it has played a significant role.

The impact of globalization on the US industrial base is undeniable. The shift toward international trade requires corporations to manage complex supply chains and become experts in supply chain logistics. Although operating on a "just-in-time" basis is the most profitable approach for companies, it increases the risk when there are disruptions to the supply chain, such as the COVID-19 pandemic or a rapid increase in manufacturing demand. Given the potential risks associated with disruptions to the supply chain of certain components used in products required by the defense and national security industries, it is crucial for policymakers to carefully consider the impact of globalization on the domestic manufacturing capacity of these critical components.

### **Consolidation of the Defense Industrial Base**

The post-Cold War era saw a decrease in defense spending and a significant transformation of the defense industrial base. According to the World Bank, the Department of Defense budget, as a percentage of GDP, peaked at 6.82% in 1982 and continued to decrease throughout the 1990s ("World Bank Open Data"). In an effort to reduce defense spending, the

Pentagon encouraged the consolidation of firms within the defense industry. In 1993, Deputy Secretary of Defense William Perry held a dinner with defense industry executives in what is now referred to as “The Last Supper” (Mintz). During this dinner, Pentagon officials acknowledged that defense spending would decrease in the following years. This reduction in revenue would inevitably squeeze margins that are necessary for companies to maintain the required returns on capital and cash flow to remain a going concern. While this approach was successful at streamlining the industry and reducing overhead, it ultimately created structural gaps in the defense industrial base. This approach resulted in significant consolidation within the defense industry, leaving the United States vulnerable to sudden surges in demand due to the risks inherent in relying on a limited number of suppliers.

Following the Pentagon's encouragement of consolidation in the defense industry, many defense firms merged and smaller suppliers were forced to pivot their business models to support commercial customers, leading to reduced competition, limited innovation, and increased costs. In 2020, the five largest defense prime contractors received just over 35% of total Pentagon spending during the fiscal year (U.S. Department of Defense). Because the Department of Defense functions as a monopsony, a market with just a single buyer, it inherently discourages small and mid-sized manufacturing companies from participating in a defense industry with historically unreliable long-term prospects.

In recent years, government officials have recognized the potential negative impact of consolidation on competition and have taken steps to enforce antitrust laws to create more competitive markets. The Federal Trade Commission (FTC) and Department of Justice's Defense, Industrials, and Aerospace (DIA) Section are two agencies responsible for reviewing defense industry mergers and acquisitions. In 2022, the FTC unanimously voted against

Lockheed Martin's proposed acquisition of rocket engine maker Aerojet Rocketdyne due to concerns that it would reduce competition in the market for solid fuel rocket motors used in missiles (Federal Trade Commission, 2022). The Pentagon has also made great progress in attracting innovative commercial technology companies through the creation of organizations such as the Defense Innovation Unit (DIU) and programs like the U.S. Air Force's AFWERX.

### **Current Challenges in Era of Strategic Competition**

While investments in innovation are incredibly necessary in the current era of strategic competition, the war in Ukraine has also identified the importance of investments in production. Within 48 hours of Russia's unprovoked invasion of Ukraine, President Biden authorized \$350 million of military assistance from U.S. Department of Defense inventories. Since then, the U.S. Congress has authorized more than \$75 billion in total assistance, with about \$25 billion in the form of weapons, munitions, and defense systems (Masters). In just over one year, the U.S. has transferred weapon systems and munitions from stockpiles that were manufactured and filled over multiple decades. According to a recent report from Dr. Seth Jones from the Center for Strategic and International Studies (CSIS), the status of U.S. inventories are considered "low" for Javelins, Stingers, 155mm howitzers, 155mm artillery rounds, and counter-artillery radar (Jones). As Dr. Jones points out, "The war in Ukraine has demonstrated that competition and conflict between major powers will require a strong industrial base in the United States" (Jones).

In a recent war game developed by the Center for a New American Security (CNAS), members of the U.S. House Select Committee on the Chinese Communist Party participated in a table top exercise simulating a Chinese invasion of Taiwan. The simulation explored the potential outcomes of an invasion and found that, due to current weaponry production delays,

Taiwan would quickly run out of defensive firepower (Kelly). As a result, there is an immediate need to increase the production of munitions to deter China from launching an invasion.

### **Leveraging Financial Markets to Increase Capacity and Refill Stockpiles**

Building the necessary capacity within the defense industrial base requires financial resources beyond the historical funding programs for munitions. Increasing production capacity faces a significant challenge: the unpredictability and instability of demand from the Department of Defense. To fully understand the challenges, it is helpful to look at the problem through the eyes of a business owner or shareholder. One of the key financial metrics that measures a firm's financial health is the cash conversion cycle. The cash conversion cycle is calculated by looking at a company's Days Sales Outstanding (what a company is owed) plus Days Inventory Outstanding (what a company has produced but not yet sold) minus Days Payable Outstanding (what a company owes its suppliers). Wall Street analysts, and in turn shareholders, look for companies to keep their Cash Conversion Cycle as low as possible. In simple terms, companies are incentivized to minimize the amount of inventory held to ensure the most efficient use of cash. To incentivize firms to hold additional inventory and increase their production capacity, the right incentives must be put in place.

One possible solution is a modified form of inventory financing. Traditional inventory financing involves a financial institution providing a term loan or a revolving line of credit so that a firm can purchase the equipment and materials needed to manufacture the products it plans to sell at a future date. When a bank provides this type of financing, it will evaluate the value of the goods, and the likelihood of a future sale, as a form of collateral. There is not much of a secondary market for munitions such as Javelin anti-tank missiles. Additionally, there is little incentive for a company to obtain financing to increase inventory without a high level of

confidence that its product will be sold at a date in the future. All term loans have an eventual maturity date that is independent of defense contracting timelines.

To incentivize companies to hold excess inventory, the Department of Defense can identify firms with the potential to ramp up production and provide loan guarantees to support financing for investments in capacity increase. The Defense Production Act's Title III already enables the Pentagon to utilize non-traditional funding methods like loan guarantees to address critical industrial capacity shortfalls. By offering lenders the necessary assurance to provide upfront capital, loan guarantees can support companies in making necessary investments to increase capacity. When combined with recent Congressional authorization for multiyear procurement contracts, companies can feel confident making the necessary upfront investments in production equipment. The cost of future conflict far outweighs the cost of increasing capacity today.

### **What About Inflation?**

Some might argue that in the current inflationary environment, now is not the time to increase domestic spending, further fueling a stubbornly high inflation rate. As of the time of this writing, inflation stands at 5%, still far above the Federal Reserve's 2% target. Financing solutions such as loan guarantees would lead to increased capital expenditures and hiring, which could further exacerbate inflation in a supply-constrained economy still recovering from COVID-19 disruptions. Additionally, with only 3.4% unemployment, hiring in such a tight labor market could contribute to inflationary pressures. How can government leaders make the necessary investments in the defense industrial base without pouring fuel on the fire of inflationary pressures that diminish overall buying power? One possible solution is the issuing of what can be called Defense Industrial Base Bonds ("DIB Bonds"). The purchase of DIB

Bonds would reduce excess liquidity in the economy while providing earmarked funding to build capacity in the defense industry. These bonds would prioritize non-traditional defense contractors seeking to expand their commercial manufacturing capabilities for defense-related production. Emphasis would be given to non-traditional defense contractors that are interested in expanding their commercial manufacturing capabilities to support defense-related production.

The federal government distributed almost \$1 trillion in federal stimulus checks to households during the COVID-19 pandemic, resulting in a United States consumer with unprecedented liquidity. This excess cash led to increased spending that compounded the already strained supply chain, contributing to the current inflationary environment. The issuance of DIB Bonds could mitigate the inflationary effects of increased government spending by taking money out of circulation. Each dollar that is invested in DIB Bonds is a dollar that is not used in the current economy, reducing inflationary pressures. Rather than traditional money market funds, U.S. citizens would have the ability to invest their excess savings in a debt security that specifically targets investing in non-traditional defense contractors interested in contributing to national security. DIB Bonds are a practical and politically appealing solution, given the bipartisan consensus that the broader manufacturing industry is unprepared for large-scale wartime production.

This is not without precedent. During World War II, Congress authorized the sale of defense-focused debt securities to support the rapid increase in war-time production. Series E Bonds, also referred to as Victory bonds, ultimately brought in \$185.7 billion from over 85 million individuals (Duke University Libraries). To put those figures in perspective, that is the equivalent of over \$3 trillion in today's dollars<sup>1</sup> and 60.7% of the U.S. population<sup>2</sup>.

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<sup>1</sup> U.S. Bureau of Labor Statistics Consumer Price Index Inflation calculator as of 8 May 2023.

<sup>2</sup> U.S. Census Bureau estimated population of just under 140 million in 1945.

DIB bonds would be structured similarly to Series E bonds, sold at a discount to face value and offering a return similar to other government securities. This would provide patriotic retirees and institutional investors with a way to contribute to domestic manufacturing that targets national security while also enhancing their investment portfolios. DIB bonds would be a highly secure investment option that deters large-scale conflict and offers stability to the global economy. Large multinational corporations would also have access to DIB bonds, further bolstering investments in the defense industrial base. Selling DIB Bonds to U.S. citizens could help fund production of defense materials that contribute to our national security, while also either reducing or counteracting the inflationary impacts of increased defense spending.

### **Conclusion**

Ensuring the strength of the U.S. defense industrial base is critical to national security. With the potential threats posed by foreign adversaries, it is essential to have a robust and reliable supply chain that can support the production of essential defense materials. Non-traditional financing solutions like DIB bonds offer a practical and politically attractive option to address the issue of funding for defense production while minimizing the inflationary impacts of increased government spending. A modified form of inventory financing together with loan guarantees will further encourage commercial lenders to support local businesses investing in building out capacity. Allowing citizens and institutional investors to directly contribute to revitalizing local economies and national security, can create a more sustainable defense industrial base that is fully equipped prepared to meet the challenges of the future.

As Sun Tzu wrote in *The Art of War*, “To subdue the enemy without fighting is the acme of skill” (Sun Tzu 77). By tapping into the strength of capital allocators and the innovative potential of American businesses, the United States can send a clear signal of resolve to potential

adversaries. President Xi and Chinese officials are keenly aware of the strength of U.S. capital markets and the U.S. consumer. Utilizing non-traditional financing solutions like DIB bonds provide a secure investment option that can deter large-scale conflict and offer enhanced stability to the global economy. By investing in its defense industrial base, the United States can bolster its national security and ensure that it is prepared to meet any potential threats that may arise in the future.

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