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SYMPOSIUM

Reflections on Alexander Field's *The Economic Consequences of U.S. Mobilization for the Second World War: An Introduction*

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In his persuasively argued and provocative new book, Alexander Field attacks the frequently made claim that there was a series of production miracles in the United States during World War II.

He begins with carefully constructed estimates of total factor productivity (TFP). He finds, surprisingly for those of us reared on the production-miracle narrative, that TFP declined during the war. This is a counterpoint to his equally surprising finding that TFP rose in the Great Depression. But why did TFP decline during the war? Partly, the decline was simply the result of the inevitable temporary fall in output that occurs when production is shifted from one product to another. Field gives the example of the Ford Motor Company's shift from Model Ts to Model As in 1927. The shift involved a complete retooling of Ford's production line. As a result, production fell from about 1.55 million automobiles in 1926 to 400 thousand in 1927. But production of the Model A soon soared. By February 1929, one million had been sold. Something similar was happening on an economy-wide scale, Field argues, in World War II.

However, the war economy faced many additional problems that undermined productivity that Field documents. These include the cutoff or severe reduction of supplies of natural rubber, petroleum for Northeastern refineries, and other raw materials; a severe labor shortage that developed toward the end of the war; and so on.

In chapters on these problems Field provides detailed narrative histories that explain his finding that TFP declined. These studies, I should add, reflect a good deal of old-school scholarship at its best. Field, clearly, has read and digested a mountain of material: academic books and articles, government reports, memoirs of participants, minutes of the meetings of government agencies, data accumulated by government agencies, and more.

Few economic historians will read every word and examine every graph and table. But many will find the book useful as a source of information about issues that they are concerned with. An historian who is interested in the development of the

synthetic rubber industry, for example, will need to read Field's chapter on it.[1] An historian who is studying the impact of wartime recruitment and drafting of military personnel will need to read Field's chapter on the shortage of labor that developed and the many controversies that the shortage produced regarding who should be exempted from military service and whether there should be a draft of industrial workers. An historian who is studying the evolution of America's dependence on long supply chains, to take another example, will want to read Chapter Nine: "Military Distribution and its Legacy." In short, the book is a feast of detailed information and ideas for economic historians.

Part of the production miracle narrative is that the war produced positive long-run benefits for the economy. Field doesn't think so. Few of the "blueprints" for production – to use Field's term – developed during the war proved useful afterwards. There are a few examples where war research had a clear impact on the postwar economy. Atomic energy is perhaps the most important. But most production plans and strategies developed during the war – here the mass production of Liberty Ships is the canonical example – were not useful afterwards.

Is it possible that the war had a long-run impact on technological progress if it didn't produce usable "blueprints"? I think this might be the case. I think the successful creation of the Arsenal of Democracy may have increased the self-confidence of American engineers and scientists and their willingness to try new things and increased the willingness of corporate managers to invest in their work.

My concern with this issue led me to undertake a case study. My father – I hope the reader will indulge a personal memory – was the chief chemist and later director of research for a small rubber-products company in the 1930s, 1940s, and 1950s. Indeed, in 1934 he made the first synthetic rubber tire in the United States from neoprene, the molecule developed by Father Julius A. Nieuwland of Notre Dame and scientists at DuPont directed by Wallace Carothers. The announcement was carried widely in the press: for example, *The New York Times*, 6-22-1934, p.1; *The Wall Street Journal*, 6-22-1934, p.1; *The San Francisco Examiner*, 6-22-1934, p.1; *The Chicago Tribune*, 6-22-1934, p.1, etc. Many newspapers simply repeated the announcement, although the *Atlanta Constitution*, 6-24-1934, p. 25 suggested that more work needed to be done to increase the resistance of the tires to punctures before they could be considered an adequate substitute for tires made of natural rubber. This announcement probably reinforced the view that the United States would be able to cope easily with a war-induced shortage of natural rubber.

Neoprene, however, was not the molecule chosen to be the mainstay of the synthetic rubber program, although some was produced. Instead, the Baruch Committee recommended, and the government adopted and funded a program to produce large amounts of Styrene-Butadiene, a molecule that had been developed by scientists at I.G. Farben in the late 1920s and licensed to Standard Oil of New Jersey. Renamed "Government Rubber – Styrene (GR-S)," it was satisfactory for automobile and truck tires and is still a widely used ingredient.

[1]I think that starting with Field's chapter is best. Additional details can be found in the sources he cites: Herbert and Bisio (1985) in particular.

My father's patenting followed the pattern described by Field. There were 0.8 successful filings per year from the first in 1934 through 1941.[2] There were 0.5 fillings per year between 1942 and 1945 and only one between Pearl Harbor and VJ day when he served as a consultant to the War Production Board. Afterwards, there were more: 1.8 successful filings per year from 1946 to 1960. An examination of the postwar patents did not suggest that specific things learned during the war contributed to the increase in the rate of patenting, again confirming Field's understanding of the evolution of aggregate technological change. The main reason for the increase in patenting in my father's case was probably the growth of the company for which he worked and the expansion of its laboratories. This undoubtedly reflected, at least in part, the strength of the postwar economy.

However, remembering the pride with which he recounted his work on synthetic rubber and related matters for the War Production Board, I think it is possible that an increase in confidence in the ability to solve technical problems, a can-do attitude if you will, fostered by the war contributed to a willingness on his part and that of his coworkers and employers to put their time, energy, and financial resources into improving existing products and developing new ones.

It's not hard to imagine, moreover, that the war improved the reputation of science and engineering generally and produced a greater willingness to invest in them. Didn't scientists and engineers figure out how to replace natural rubber with synthetic rubber and didn't they also figure out how to build the atomic bombs that ended the war?[3] Field may be right that the synthetic rubber program was not a "miracle," but the thought that it was may have influenced spending in the postwar economy.

One of the main reasons economic historians study wars is that wars provide natural experiments in which economic policies are changed dramatically. Thus, by studying wars we can gain insights into how changes in economic policies effect the economy.

This was clearest, as Field recognizes, in the case of macroeconomics where the experience of World War II had a tremendous impact on the views of economists about the determinants of economic activity. The war proved to an overwhelming majority of macroeconomists that Keynes was right: Massive government spending financed by borrowing would stimulate an economy and therefore could end a depression. When Germany invaded France in May 1940 the unemployment rate in the United States, although substantially lower than it had been in the early 1930s, was still high at 10.9 percent. When Japan surrendered in August 1945 it was 1.5 percent (National Bureau of Economic Research, Unemployment Rate for United States).

Indeed, Keynes had cited the natural experiments with government spending provided by wars in his famous open letter to President Roosevelt (Keynes 1933). In two brief sentences he explained the medicine he prescribed for ending the Great Depression and the evidence that this medicine would work: "But in a slump

[2]Successful filings, at least in my father's case, are a better reflection of when the research was completed than patents granted because there was typically a lag of several years between the filing and the granting of the patent. Indeed, the average was nearly four-and -a-half years.

[3]Kevles (1992) provides some empirical evidence.

governmental Loan expenditure is the only sure means of securing quickly a rising output at rising prices. That is why a war has always caused intense industrial activity."

He went on, of course, to explain that in peacetime the same stimulation to employment could be achieved by spending on non-war projects of value to the economy such as repairing the nation's railways.

The World War II experiment also led in a short period of time to one of Milton Friedman's early efforts to revive monetarism. During the Korean War, he published "Price Income and Monetary Change in Three Wartime Periods" (Friedman 1952). In this article he showed that prices in the United States had risen by an amount similar to the increase in money per unit of output in the Civil War, World War I, and World War II. The point, obviously, was that inflation in the Korean War could be avoided by stabilizing the ratio of money per unit of output.

Along with his skepticism about the long-run benefits of the war for productivity, in some cases Field's findings – namely, that productivity declined substantially during World War II and that massive production of arms was not a miracle – undermine the use of the wartime analogy for supporting public policy choices; it strengthens it in others. It undermines the "prairie-fire case" for engaging in wars: the argument that there is a benefit to going to war because wars clear out old economic institutions and lay the groundwork for the adoption of new institutions that foster rapid postwar growth.

However, to ride one of my hobby horses (Rockoff 2019), I believe Field's work strengthens the case for claiming that the World War II analogy supports the case for the feasibility of a large scale federally financed effort to convert the American economy from one reliant on fossil fuels to one reliant on renewable forms of energy. After all, the transformation of the US economy in World War II from one producing small amounts of arms into the great "Arsenal of Democracy," Field shows, wasn't a miracle and therefore something that could only be repeated with the help of divine intervention. No: The United States converted its economy through hard work and spending lots of money. Something similar could be done again.

True, conversion involved a good deal of short-term pain and that is likely to be true if we replace fossil fuels with renewable forms of energy. However, as is often pointed out, although the output mix was changed drastically in World War II, consumption was maintained at a surprisingly high level. The series on real personal consumption expenditures in the Millennial edition of *Historical Statistics* (Carter 2006, series Ca85) rises from 1940 to 1941, falls from 1941 to 1942, and then rises every year for the remainder of the war. Indeed, it is higher in every year of the war than it was in 1940. When I deflated the series on "the value of the U.S. consumer bundle" available at measuringworth.com with their "consumer price index" I found a similar pattern.

To be sure, measuring prices in a period in which production of many durables was discontinued and consumption spending was distorted by price controls and rationing is fraught with difficulties. However, the impression that consumption was maintained at a surprisingly high level is supported by many narrative histories of the war. One of the best popular histories of the war is Richard Lingeman's (1970) *Don't You Know There is a War On?* The title is a phrase often used during the war

to chastise people who seemed to be more concerned with personal enjoyment of newfound income than with winning the war. Lingeman discusses all the constraints imposed on individuals during the war: gasoline rationing, the shortage of new consumer durables, and so on. But he also discusses how Americans were able to indulge their demands for new books, magazines, movies, nightclub visits, and Broadway shows.

Thus, despite the costs and productivity decline, the war analogy suggests that if we can summon the will to do the work and spend the money, we can convert the economy into one reliant on renewable energy.

In this brief comment on Field's book, I could not mention all the important questions it raises. Indeed, one of the strengths of the book is that it raises many questions that can be pursued profitably in the future. My message for a graduate or undergraduate student looking for a topic for their research: Read this book! The title of the concluding chapter is from a well-known song: "Do You Believe in Magic." While reading this book on productivity during World War II after having read Field's earlier work on productivity during the Great Depression, another song came to mind: "Nobody Does It Better."

References

Carter, Susan B., and **Cambridge University Library**. (2006) Historical Statistics of the United States: Earliest Times to the Present, Millennial ed. Cambridge; New York: Cambridge University Press.

Friedman, Milton. (1952) "Price, income, and monetary changes in three wartime periods." American Economic Review **42** (2): 612–25. Papers and Proceedings of the Sixty-Fourth Annual Meeting of the American Economic Association, May 1952.

Herbert, Vernon, and Attilio Bisio. (1985) Synthetic Rubber: A Project that had to Succeed. Westport, CT: Greenwood Press.

Kevles, Daniel J. (1992) "Foundations, universities, and trends in support for the physical and biological sciences, 1900-1992." Daedalus **121** (4): 195–235.

Keynes, John Maynard. (1933) "Letter to President Franklin D. Roosevelt." The New York Times, December 31.

Lingeman, Richard R. (1970) Don't You Know There's a War on? The American Home Front, 1941-1945. New York: Putnam.

National Bureau of Economic Research, Unemployment Rate for United States [M0892BUSM156SNBR], retrieved from FRED, 12-12-2023.

Rockoff, Hugh. (2019) "U.S. mobilization during the second world war as a model for coping with climate change," in Fredrik Albritton Jonsson, John Brewer, Neil Fromer, and Frank Trentmann (eds.) Scarcity in the Modern World: History, Politics, Society and Sustainability, 1800-2075. Bloomsbury Academic: 135–56.

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