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Price and Production Controls in World War II

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I. Introduction

During World War II the United States created a profusion of agencies to manage the conversion from peace to war and to control the war economy.¹ This experiment in government intervention may be studied from many perspectives. Typically, economic historians are interested in the lessons that might be learned about how similar interventions would work in peacetime. For example, one can look at the civilian sector and ask how well price controls worked in controlling inflation, or how effective the War Manpower Commission and the War Labor Board were in preventing strikes. Here, however, my focus will be on the role played by government agencies in accomplishing the primary initial task: increasing the production of munitions. In other words, did government intervention speed up mobilization?

The usual answer is that government intervention was crucial for achieving a rapid and successful conversion. Not everything went smoothly, but in the end the weapons got built. Germany and Japan were defeated. When the chips were down, in other words, the United States relied on a command economy, rather than a market economy. As I show below, however, I believe this view mistaken. For the most part conversion was coordinated in the old-fashioned way, by the market.

Reliance on the market was a matter, mostly, of timing. Mobilization was set in motion by a flood of highly profitable war contracts in 1941 and 1942 that inaugurated a great building boom. By the time government agencies could be set up, policies thought

through, and problems of interagency coordination resolved, construction of the war economy had largely been completed. The difficulties inherent in planning, however, do play a role in the story. It is not easy for central planners to coordinate economic activity in a complex modern economy, and those problems do not disappear when the economy goes to war.

II. Setting Up the Bureaucracy

I concentrate on the two agencies most concerned with coordinating the mobilization, the Office of Price Administration and the War Production Board, and the two agencies that watched over them, the Office of Economic Stabilization and the Office of War Mobilization. This focus is not meant to deny that many other agencies -- the War Labor Board, the War Manpower Commission, the War Food Administration, the Defense Plant Corporation, and so on -- had a substantial impact on the economy at one time or another. But space constraints will not permit us to review their activities.

The formation of the wartime bureaucracy began with the establishment of the National Defense Advisory Commission in May 1940.² The personnel for the Commission were chosen to reassure major interest groups that they would have a voice: William Knudsen, president of General Motors, represented big business, Sidney Hillman of the Amalgamated Clothing Workers of America, represented labor, and so on. Each member of the Commission worked on a particular aspect of the economy and built a staff of experts.

These became the nuclei of the agencies that would attempt to manage the economy in the following four years.

In January 1941 the Office of Production Management, was formed from the group working on production at the National Defense Advisory Commission, and Knudsen and Hillman were made co-directors. The point, again, was that both management and labor would have a voice in all crucial decisions. The idea of co-directors, however, was criticized heavily in the press on the grounds that things would get done only when one strong individual was put in charge.

This criticism, that mobilization required a boss with the power to order necessary changes, would recur again and again throughout the war. Sometimes the criticism would turn upon itself: mobilization required a powerful czar who was in charge of everything, but when particular problems arose, the rubber shortage for example, the call would go out for a rubber czar whose word would be law. At the time, this hankering after czars, had a broad constituency, and would shape subsequent developments. Liberals had little faith in the market. And the less ideological were impressed with the idea that Germany had achieved rapid and total mobilization thorough centralization of control. The military, moreover, was held in high regard, and the military works through commands.

In April 1941 the Office of Price Administration and Civilian Supply was created in a like way, with Leon Henderson, a new-dealer in charge. In August 1941 the agency's responsibilities for the

supply of civilian goods were transferred to the Office of Production Management, and the agency became simply the Office of Price Administration (hereafter OPA), which it would remain for the remainder of the war.

In January 1942, the Office of Production Management was reorganized as the War Production Board (hereafter WPB) with Donald Nelson, a Sears executive in charge.³ Thus, the United States entered 1942 with one agency in charge of prices and another in charge of quantities and with no explicit mechanism in place for coordinating their decisions. OPA might believe that rationing would help it to hold down prices, but it had to convince the WPB, an agency with a different mission, that rationing was necessary. The WPB might believe that a price increase would help increase the production of munitions, but it had to convince OPA, an agency with an entirely different mission, that a price increase was necessary.

A degree of coordination was achieved when the Office of Economic Stabilization was created in October 1942, and James F. Byrnes resigned from the Supreme Court to take charge. The main purpose of the Office of Economic Stabilization, however, was to resolve disputes between OPA and sister agencies that had responsibilities with respect to prices such as the National War Labor Board (wages) and the Department of Agriculture (food prices). These were important disputes: the War Labor Board, for example, often felt that price increase would permit a wage increase that would aid it in achieving its goal of promoting cooperative labor relations. But the Office of Economic

Stabilization did not provide a mechanism for coordinating price and production decisions.

In May 1943 Byrnes moved on to a new agency, the Office of War Mobilization, to settle disputes among the WPB, some of its sister "quantity" agencies such as the U.S. Maritime Commission, and the military. The Office of Economic Stabilization and the Office of War Mobilization were not brought together until 1945 when the Office of Economic Stabilization became part of the Office of War Mobilization and Reconversion, a receptacle created in the process of dismantling controls.

Thus, during the crucial period in which the arsenal of democracy was being constructed the United States had a group of "price" agencies with the OPA heading the list, attempting to hold down prices; and a group of "quantity" agencies with the WPB heading the list, attempting to maximize the output of war goods, and with no one giving much thought to how conflicting policies could be coordinated.

III. The Impact of Price Controls⁴

Price controls went through three principal phases in World War II, as shown in figure 1.⁵ The first phase, selective controls (SEL in figure 1), lasted about one year from April 1941 (when the Office of Price Administration and Civilian Supply was created) to May 1942. The second phase, under the General Maximum Price Regulation (GMX in figure 1), also lasted about one year, from May 1942 until April 1943. The final phase, Hold-the-Line (from a

famous speech by Roosevelt), lasted more than three years, from April 1943 to June 1946, although the system began to fray in 1945. There were, it should be noted, limited efforts to control some prices, mostly but not entirely through exhortation, prior to April 1941, and limited attempts to restore some controls after June 1946, but the main period of controls was from April 1941 to June 1946.

During the selective-control phase, OPA's assumption was that the entire price level could be restrained by controlling a selected set of "strategic" prices, including the prices of key raw materials. The price of steel had to be restrained, but the price of tulips could be ignored. A markup pricing model seems to have been at the root of the thinking behind selective controls. Control the price of raw steel and the prices of things made out of steel, from pins and needles to ships and tanks, would take care of themselves. OPA also applied controls to prices that were "spiraling" out of control because of intense wartime demand. Used machine tools were one of the earliest targets for control, controls in this area coming even before the period I have marked as selective controls (SEL) in figure 1.

With demand for all goods surging ahead, however, a policy based on markup pricing was doomed to failure. The makers of pins and needles and ships and tanks would raise their prices even if the prices of the raw materials they used were fixed. It is conceivable, moreover, that money saved in the controlled sector was spent in the uncontrolled sector, forcing up prices in that

sector even faster than would have been true in the absence of controls. In any case, it is clear from figure 1 that selective controls failed to make a dent in the upward surge in prices.

The failure of selective controls to restrain inflation led to the General Maximum Price Regulation (GMX in figure 1), which became effective in May 1942. This order froze virtually all prices at the highest level reached in March. The General Maximum Price Regulation was a stopgap intended to slow inflation while controls tailored to the needs of particular markets could be developed.

The Regulation (affectionately, General Max) solved one of the problems inherent in selective controls: the incentive to shift resources from the controlled to the uncontrolled sector. But it also tended to freeze relative prices, suppressing adjustments that would have speeded mobilization. It was also open to abuse. Under the General Maximum Price Regulation it was up to the firm itself to identify the price it charged for a product in March, or if it was not selling the good in March to identify the price at which a product was sold by a rival. Naturally, firms would pick the highest justifiable price. If the good was sold by several rivals, for example, a firm would naturally point to the price charged by a high-volume-low-service rival, rather than to the price charged by a low-volume-high-service rival.

The effects of the General Maximum Price Regulation can be seen in figure 1. The rate of increase in the wholesale price indexes was reduced significantly. The effect was more pronounced for the commodity index than for the manufactured products index,

probably because the distributions of commodity prices were narrower in the base period, making it harder to point to unusual high-priced sales to justify prices after May 1942. The cost of living index, however, continued its merry way upward, producing considerable criticism of OPA and the government's stabilization program.

Roosevelt's response was his Hold-the-line order issued in April 1943 which ordered OPA to prohibit most increases in prices. And this is what OPA did. An industry was entitled under Hold-the-line rules to raise prices to cover increases in out-of-pocket expenses.⁶ But further increases ran into OPA's tough profit standard -- an industry was entitled to no more than the dollar amount of profits it had averaged in 1936 to 1939. Under Hold-the-line, moreover, it was OPA that applied the standards and determined the dollar-and-cents price that could be charged, rather than the firm; OPA came up with the dollar and cents price the local grocer charged for a can of tomato soup.

The impact on the price indexes was impressive. As figure 1 shows, the price indices stabilized a few months after the hold-the-line order and remained stable until the system began to fray after VJ day.

There were, to be sure, various forms of evasion that developed during the Hold-the-line phase, so the price indexes understate the true rate of inflation (and overstate it in the period after controls were lifted). Some evasions might have been expected by any student of economics. Quality deteriorated:

butchers tried to add fat to their hamburger, candy makers substituted inferior ingredients, landlords cut back on maintenance expenditures. And there were open black markets for some goods, poultry and beef, for example.

One ubiquitous problem, that might have been harder to foresee, was known as "forced uptrading." Typically, manufacturers produced several different versions of its product: a high-quality-high-price line of clothing, for example, intended for wealthy consumers, and a low-quality-low-price line intended for the mass market. The high-priced line was usually the high-profit-margin line, while the low-priced line carried a lower profit margin, which was offset by the economies of mass production. During the hold-the-line phase the manufacturer could cut back or discontinue the low-priced line, forcing consumers to "trade up" to the high-price line. It was a difficult form of evasion to police, because the manufacturer could legitimately claim that he had not changed the prices he was charging for his products.

Attempts have been made to quantify these problems, and thus to measure the true rate of inflation.⁷ The measured rate of increase in consumer prices was 2.8 percent per year from December 1943 to June 1946; a lower-bound adjustment for hidden price increases places the rate at, perhaps, 3.4 percent. A good case could be made that the true rate was even higher. When all is said and done, however, it still appears to have been an exceptional achievement.

The point to be emphasized here, however, is that as important

as this achievement may have been in preserving (at least for a few years) the purchasing power of individuals who were not able to join in the rise of incomes during the war, the elderly on fixed incomes for example, or in easing the government's financial burdens, it probably had little to do with the successful conversion of the economy into the "arsenal of democracy." Conversion took place in 1941 to 1943. By the time the Hold-the-line policy began to bite in the summer of 1943, the building-and-conversion boom was well-passed its peak, and munitions production was well on its way to its wartime peak, as the new and converted plants came up to speed.

Had the price control program been directed at maximizing the speed of conversion and the ultimate level of munitions production large increases in the prices of the raw materials crucial to the war effort would have been permitted, assuming that the relevant supply curves were upward sloping, especially during the conversion phase. The actual policy was almost the exact opposite.

During the conversion phase price control was most effective with respect to basic raw materials. This was partly by design. During the phase of selective controls, and to some extent throughout its history, OPA was, as we noted above, most concerned about strategic prices which included the prices of basic raw materials. It was also a reflection of the administrative task to be performed. It was far easier to control the prices of raw materials available in a small number of uniform grades, than the prices of finished products that might differ in a myriad of ways

from model to model and from producer to producer.

Steel was an important and typical example. Steel prices, including the prices of war steels (armor plate, aircraft tubing, armor piercing shot, and so on) were frozen at 1940 levels. From December 1941 (Pear Harbor) to May 1943 (Hold-the-Line) iron and steel prices rose only .23 percent, and fell 10.43 percent relative to wholesale prices in general, and 21.06 percent relative to the cost-of-living.⁸ Over the period December 1941 to May 1945 (VE Day) iron and steel prices rose only 1.43 percent, and fell 11.01 percent relative to wholesale prices, and 23.45 percent relative to the cost-of-living. These are hardly the relative price changes one would have expected in an economy trying to maximize munitions production.

There was a saving grace. When the war began war steels were low-volume-high-profit items. Freezing prices thus permitted profits to increase substantially as producers expanded production of war steels.⁹ (Cutler, 1947, 61). Final product prices for military goods, moreover, were not controlled by OPA. Thus, OPA price controls on steels and other basic raw materials did not seriously interfere with the mobilization. But clearly they did nothing to speed the mobilization.

A case could be made that price controls contributed to the ability of the economy to sustain the high level of munitions production once it was reached by preserving the purchasing power of the wages of production workers. Labor made a no-strike pledge, but it was hard to live up to when increases in the cost-of-living

were eroding real wages, and in a number of cases, most notably the coal mines, the pledge was broken. The contribution of cost-of-living stability to the war effort through this channel was, however, dependent on a wage policy that was directed at stabilization and equity rather than achieving war production by encouraging a substantial wage differential between war production and civilian production.

A case could also be made that price control reduced the growth rate of the money supply and thus the extent of the wartime price increase. (Rockoff, 1981). Since munitions were paid for partly by creating new money, fixing the prices of the raw materials going into munitions held down the wartime increase in the stock of money. The contribution of resource-price stability through this channel was, however, lay in the direction of equity and postwar stability rather than to the speed of the mobilization.

All in all once can conclude that price controls made a limited and probably negative contribution to the speed and maximum degree of the mobilization. Does the explanation for the success of the mobilization lie, therefore, with production controls?

IV. The Impact of Production Controls

Production controls, like price controls, went through a series a phases illustrated in figure 2 which shows the major phases on a plot of basic metals production.¹⁰ The first phase was priorities. The idea was simple. Someone in authority, the Army-Navy-Munitions Board or the WPB, for example, would stamp a

contract with a priority rating -- the first set of ratings went A-1 ... A-10, B-1 ... B-10, C-1 ... C-10 -- and a manufacturer would be required to fulfil the contract bearing the higher priority first, an A-1 contract before an A-2 contract and so on. Priorities, it is important to note, accompanied the demand for resources derived from the priority on the initial contract. A manufacturer of Tanks could place an A-1 priority on his order for steel, a manufacturer of garden tools could place only, say, a B-1 rating on his demand for steel. The steel mills would fulfill the order for steel for tanks ahead of the order of steel for garden tools.

It sounded good. The priorities system had been heavily touted during the twenties and thirties by Bernard Baruch, who had been chairman of the War Industries Board in World War I, and who claimed to have successfully employed priorities. And it appealed to the military, and to the public for whom the military now appeared to be the preeminent authority on how to get things done. After all, the military works by commands. Generals order soldiers into battle; they don't stop to negotiate mutually acceptable financial rewards. But from the start there was a serious problem: priorities inflation.

To each bureaucrat separately, it appeared that the contracts crossing his desk deserved the highest priority. After all, who would be blamed if it later turned out that an important program was dangerously behind schedule because some fool of a bureaucrat had given the contracts for that program a low priority? The

delegation to prime contractors of the authority to place priorities on subcontracts added to the flood of high priorities. A manufacturer with any A-1 on contracts was tempted to stamp A-1 on all his subcontracts.

In November 1941 the A-1 rating was broken into A-1-a through A-1-j. Later still, higher ratings were added. Eventually, the system stabilized with ratings of AAA and A-1 ... A-4, although raw materials were relatively abundant during most of the time in which the last set of ratings was used.

In August 1941, in the midst of the priority crisis, Roosevelt created the Supply Priorities and Allocation Board to bring together representatives of the various agencies issuing priorities including the Army-Navy Munitions Board and the Office of Production Management, to set, hopefully, overall policy. But the Board never solved the basic problem of the priorities system, constraining the number of high priorities for each good to be less than or equal to the amount produced. The Supply Priorities and Allocation Board was abolished in January 1942 and its functions were transferred to the WPB.

As figure 2 clearly shows, the production of crucial raw materials was rising rapidly even as the priorities system was exploding into priorities hyperinflation. A flood of profitable orders, liberal financial incentives for private investment, and most importantly, direct government funding for facilities expansion were producing a rapid response, thus laying the groundwork for a deluge of munitions.

The WPB attempted to solve the problem of priorities inflation with the Production Requirements Plan (PRB in figure 2). Under this plan manufacturers were supposed to file detailed reports with the WPB showing their contracts (including preference ratings), and their inventories of raw materials. The WPB then would decide on the amount of raw materials the manufacturer was allowed to buy, and the preference ratings that it could assign to those purchase orders. The Production Requirements Plan made use of priorities, but it promised improvement along two lines. First, it took the power to issue priorities for raw materials away from prime contractors and secondly, it created a flow of information from which the WPB might hope to compute and eventually match aggregate supplies and priorities.

The Production Requirements Plan, however, turned out to be a failure, and was quickly abandoned. Novick, Anshen, and Truppner, (1949, 129-135) who worked for the WPB, and who are generally sympathetic to it, readily admit the failure of the Production Requirements Plan. They attribute the failure to the inadequacy of the bureaucracy set up to administer the Plan -- it wasn't big enough and wasn't given enough time to get organized -- and to opposition to the Plan by the military and elements within the WPB, who stood to lose some of their authority.

The Production Requirements Plan was followed by the more famous Controlled Materials Plan. The Plan, although complicated in detail, was essentially a system for rationing three important raw materials: steel, copper, and aluminum. The system, although

modified over time, went ahead for the most part according to an outline issued in November 1942 when the plan was announced. It went into operation on a trial basis, a shakedown cruise, in April 1943 and on a compulsory basis in July 1943. The basic idea was relatively straightforward. Mills producing the basic metals would fill first orders to which allotment numbers, essentially ration tickets, were attached.

How would the WPB make certain that the amount of allotment numbers equaled the supply of controlled materials? First, the WPB would estimate future supplies of the controlled materials. Then a corresponding amount of allotment numbers would be divided among a list of claimant agencies that included the War Department, the Navy, the U.S. Maritime Commission, the Aircraft Scheduling Unit, the Office of Lend Lease Administration, and several others. Then, it was then the job of the claimant agencies to divide their shares among their prime contractors, and the job of the prime contractors to divide their shares among subcontractors, and so on. The key innovation was that the claimant agencies and the prime contractors would be dividing a fixed amount of allotments. Under the failed priority system the claimant agencies could create priorities at will.

Much has been claimed for the Controlled Materials Plan. The official history of the Army in World War II, for example, is extremely enthusiastic.

The announcement of the Controlled Materials Plan in November 1942 committed the nation to its most difficult and heroic undertaking in the World War II economic mobilization program. The application and refinement of

the new system, together with related developments, succeeded by late 1943 in bringing a high degree of order into the entire field of war production. (Smith, 1959, 710)

But it is Eliot Janeway's ecstatic account that remains most influential among historians.

It [the Controlled Materials Plan] quickly balanced the input of economy energy and the output of fire power. In 1942 the war economy produced something over \$30 billions of finished munitions. In 1943, at virtually the same price level, munitions production fell just short of \$60 billion ... CMP flooded the fighting fronts with firepower. (Janeway 1951, 316).

The Controlled Materials Plan was a step forward from the priorities system, which failed to take aggregate supply and demand into account, and from the Production Requirements Plan, which attempted an impossible amount of detailed planning. Ferdinand Eberstadt, who developed the Plan, deserves the praise that was showered on him by Janeway and other writers. But the plan did not produce a production miracle.

The Controlled Materials Plan might have been helpful had it been introduced earlier, but by the time it went into effect there was, in general, enough steel, copper and aluminum to meet the needs of the war economy. As figure 2 shows, the supplies of basic metals were already reaching their wartime maximums when the Controlled Materials Plan went into effect. There were, of course, numerous problems in individual programs. But the basic problem that the Controlled Materials Plan was designed to solve, the scramble among the military and civilian agencies for limited supplies of basic metals was winding down.

V. Munitions Production

We can bring the threads of our argument together by exploring the relationship between developments on the price and production fronts and the progress of munitions production. An index of aggregate munitions production is plotted in figure 3.¹¹ The components are indexes of real amounts of munitions -- indexes of planes, tanks, ships, and so on -- weighted by 1943 values. The average for the aggregate is set equal to 100 in 1943. The index was computed by the WPB but it was not released, presumably for security reasons, until 1944. Thus, during the early phases of the mobilization, the public had only sketchy ideas, about how fast it was preceding, and this may have fed some of the criticism.

The issue of the hold-the-line order, the beginning of strict price control, and the inauguration of the controlled material plan, the vaunted solution to the problem of priorities inflation, are shown as vertical lines. As is evident from the figure, neither measure can be given credit for the rapidity or extent of the mobilization. When the hold-the-line order was issued in April 1943, munitions production was already at 83 percent of the maximum reached in November; when the controlled materials plan was introduced production was at 86 percent of the maximum.

It seems highly unlikely, moreover, that the strong upward thrust in munitions output would have ended suddenly in the absence of these measures. Once the factories and shipyards were completed the main source of increased productivity and output was economies

from long production runs. The tenth destroyer required far fewer labor-hours to produce than the first.¹²

A better case could be made that these measures, the hold-the-line order in particular, helped sustain a high level of production through the next 18 months. (See figure 3). Relatively stable prices, as we noted above, may have diminished the likelihood of confrontations in the labor market. But viewed from the technical side there appears to be little reason why the level reached in late 1943 could not be sustained almost indefinitely. The factories had been built, the labor force had been assembled and trained, technical bugs had been worked out, and raw materials were abundant.

VII. What Was Happening?

If OPA and the WPB were not responsible for the speed and maximum level of the mobilization, what was? In 1941 and 1942 the United States undertook an enormous building boom. New capacity was added in steel, aluminum, and other industries providing basic raw materials, and factories to turn out tanks, planes, and ships were created by converting existing factories and building new ones. The bulk of the money for the boom came from the Federal government, primarily from the Defense Plants Corporation, a unit of the Reconstruction Finance Corporation, which rented the plants at nominal fees to private operators. A smaller, but significant, share of the funding came from private sources spurred by generous amortization schedules.

Figure 4 shows gross private expenditures on new plant and equipment and Gordon's estimates for new plant and equipment owned by the government and operated privately.¹³ Note the sharp peak in 1942.

The federal government, as figure 4 shows, financed the majority of the expansion, but the amounts financed by the private sector (induced in part by very favorable amortization allowances) was important. The government financed, for example, about 66 percent of the expansion in steel, about 88 percent of the expansion in aircraft plants, half the expansion in aluminum, and all of the expansion in synthetic rubber.¹⁴ The basic idea was that the government would finance expansion that was not expected to have much value after the war. But of course, whether a particular plant would be viable after the war was anyone's guess. The postwar profitability of synthetic rubber plants, for example, depended on what happened to the notoriously volatile price of natural rubber. In any event, it was often in the firm's interest to argue that the plant or equipment would not be useful after the war was over, because the firm would have the inside track when the government sold its assets after the war.

In addition, government money went into arsenals that remained under government control. Adding in this amount would make the wartime levels even higher than those shown in figure 4. The amounts, however, were not large compared with those in the figure. Over the period July 1, 1940 to December 31, 1945 government expenditures for new plant and equipment owned and operated by the

government came to only about 5.7 percent of the amount operated by the private sector. (Gordon 1969, 226).

Much of the money being spent in 1943 and 1944 was on projects begun earlier. A more precise sense of the timing of the construction boom is revealed in figure 5 in which an index of the value of nonresidential construction contracts awarded is plotted.¹⁵ This series reaches a very sharp peak in July 1942.

Not everyone was pleased with the emphasis on building new plants. Keynes was one of the skeptics. In a perceptive letter to the Chancellor of the Exchequer dated June 2, 1941 Keynes (1979, 105) wrote:

Generally speaking the plants for manufacturing for defence are completely new and are not adaptations of existing plants. One is told that this is more efficient in the long run, but meanwhile business is much more occupied in building plants than in building machines. Perhaps manufacturers have preferred this because it enables them to continue with business as usual alongside the defence programme which is merely superimposed. All this will, I am sure, result in a fabulous output in due time. ... It is only that I am not perfectly convinced that the near-term programme could not be still greater than it is going to be, if full attention was concentrated on it. The precise date at which we shall be ready to deliver the knock-out blow is relatively so unimportant compared with having the maximum equipment over the next nine months. This is understood in general. But it is in the ultimate fabulous programme that they are most practically interested.

The business-as-usual syndrome ended with Pearl Harbor, but the emphasis on the "ultimate fabulous programme" persisted. Partly, this reflected the technical background of many decision makers in government and the private sector (a situation more common then than now) -- the technician's desire to do things right. William Knudsen one of the co-directors of the Office of Production

Management and an expert on designing cars and production lines is a prime example.¹⁶ The emphasis on mass production also may have reflected the recognition that U.S. casualties could be minimized by delaying the knock-out blow and then delivering it with overwhelming force. America's soldiers deserved the finest weapons money could buy.

It was the largest industrial building boom the United States, and probably the world, had ever seen. Could the magnitude have been anticipated on the basis of what had happened in previous periods? In some sectors the expansion was similar to earlier achievements. Steel capacity, for example, rose from 81.6 million short tons in 1940 to 90.6 million in 1943, a 10.4 percent increase. But it had risen from 69.6 million in 1929 to 76.9 million in 1932, a similar 10.0 percent increase over the same number of years. But overall the boom was unprecedented. Figure 4 also shows the level of spending in constant dollars on new plant and equipment in 1929, the previous best year. It was not quite half the level achieved in 1942.

What guided resources to these factories, to construct and staff them? It wasn't, generally speaking, price and production controls. As we have seen the great building boom of 1942 was undertaken while price controllers were still experimenting with selective controls or unravelling the consequences of the General Maximum Price Regulation. It was undertaken while production controllers were still wrestling with priorities inflation. Labor and capital were drawn to the war production centers by prices.

Jobs were available at high wages; construction contracts to build the new factories or refit old ones and contracts for munitions to be produced in them offered high profits.

The mobilization is best characterized, I believe, as the gold rush of 1942. Under the gold standard the government paid a fixed price for all the gold that private entrepreneurs could produce.¹⁷ During the mobilization the government paid a high price for all of the gunpowder, planes, tanks, and ships, that private entrepreneurs could produce. Indeed, in 1942 entrepreneurs did even better than they did in 1849 because the government not only bought the final product but it also absorbed many of the risks. When gold was discovered in California in 1848 the favorable relationship between the price the government would pay for gold and the cost of producing it was recognized immediately. Men and women stopped plowing, unhitched their horses, and headed for California: no one coordinated the mobilization of resources. There were shortages, and overcrowding, and many people who hoped to get rich didn't. But in a few years a flood of gold was changing economic conditions throughout the world.

Something similar happened in 1942. Once the favorable relationship between the prices the government would pay for munitions and the cost of producing them was recognized the rush was on.¹⁸ Here is Janeway (1951, 172) on one episode.

At Charlestown in Southern Indiana, du Pont went to work on a major powder project. Attracted by the atmosphere of boom, swarms of unskilled labor swelled the population from 800 to 5,000, to 15,000, to a mass of unabsorbed and unhoused workers spread over all the neighboring towns.

Bret Harte could have written the scene.

VII. What Else Was Going On?

It does not appear that OPA or the WPB speeded up the mobilization. It is conceivable, of course, that some other agency or agencies -- the military for example -- might deserve the credit for the rapidity of the mobilization. Or it may have been that many agencies made a small positive (or negative) contribution that in the aggregate added up to a lot. Space does not permit a full evaluation of the contribution of other agencies. All that I can do here is point out a few reasons why I am skeptical that bringing in the contributions of other agencies would change the general picture.

First, the central economic problem was the reallocation of resources to the war sector. OPA and the WPB were given the tools (the power to fix prices and allocate resources by fiat) to influence the process of reallocation. Other agencies were given jurisdiction over limited sectors, limited powers, or missions only indirectly related to the reallocation of resources. Second, historians, beginning with Janeway and continuing to the present, who have attributed the speed of the mobilization to government intervention have focussed on these agencies, and in particular on the Controlled Materials Plan of the WPB. No other candidate or candidates have been brought forward. Third, my impression is that in some cases agencies were intervening to correct problems created by interventions undertaken by other agencies, the net effect may

well have been zero. And finally, my impression, based admittedly on a rather preliminary survey of the literature, is that most agencies, like OPA and the WPB, spent the crucial years 1941-43 groping for a coherent policy.

We do need, however, to take a look at the agencies that lay up stream from the OPA and the WPB: the Office of Economic Stabilization and the Office of War Mobilization. There is no doubt that these agencies weighed in with considerable clout, primarily because it was recognized that James F. Byrnes, who headed them during their crucial years, was close to the President.¹⁹

The main purpose of the Office of Economic Stabilization was to resolve disputes among the "price" agencies, particularly between the National War Labor Board, which set wages, and OPA, a purpose that grew in importance as wage and price controls began to bite.

In November 1944, to illustrate, the National War Labor Board announced a decision to grant steel workers a package of wage increases. In principal this was a preliminary finding that had to be approved by the Director of Economic Stabilization, whose approval was in turn contingent on a finding by OPA that the wage increases would not require price increases. Because labor unrest leading to a strike was a real possibility, OPA was under enormous pressure to provide such a finding. Ultimately OPA found a face-saving formula that allowed the Director to approve the wage package. (Cutler, 1947, 50-52). This six-sided game among labor, capital, the Labor Board, the Office of Economic Stabilization,

OPA, and the public would grow even more intense after VJ day and the end of the no-strike pledge.

Thus, the Office of Economic Stabilization found itself, eventually, playing a central role in the price control program. Nevertheless, it seems unlikely that it contributed a great deal to the speed or overall level of the mobilization. Again, the contribution of the Office appears to have been more important in the years 1943-45, when policy was aimed at maintaining a stable price level and cutting back the military program to permit greater civilian consumption, rather than during the buildup in 1941-1943.

The Office of War Mobilization, sounds like the ultimate regulator of the economy, but its role was in fact limited. There is an excellent, and generally sympathetic, history of the Office by Herman Somers (1950). Somers gives a number of examples of successful interventions by the Office of War Mobilization, but all of them come after the mobilization was near or after its peak. (The Office was created in May 1943; munitions production was then at 82 percent of its wartime peak.) As he notes (Somers, 1950, 117) the Office of War Mobilization "did not undertake any revisions of the basic machinery for procurement, allocation, and production controls developed by mid-1943. Whether that machinery needed overhauling will long be argued but, in any event, most observers agree that it was too late in the game for that kind of change." Rather Somers's claim is that the Office provided "authoritative coordination for that machinery, a center of direction, and ended the deadly impasses caused by the previous lack of authority."

What sort of things did the Office of War Mobilization do? Here are two examples, typical of those cited by Somers. (1) Shortly after his appointment, Byrnes wrote to the heads of all the procurement agencies calling on them to undertake thorough reviews of their current levels of procurement. The amount of the savings that can be attributed to the review process set in motion by Byrnes is, of course open to question. Byrnes was more influential with the Army than with the Navy because the Navy felt that it could go directly to Roosevelt for support. But it seems likely that Byrnes helped convey the message that Roosevelt believed that the time for cutting back military spending had arrived. (2) Byrnes's greatest triumph in relation to the Navy occurred early in 1945 when the Navy sought funding for an additional 84 vessels. The program was aimed more at the postwar era than at the war itself, and partly through Byrnes's intervention it was reduced to 12 ships with a savings estimated at 1.5 billion.

In short, as things turned out, the main function of the Office of War Mobilization seems to have been in communicating Roosevelt's desire that the military services begin to cancel contracts for equipment that was clearly going to prove redundant. This was important work, but it did not contribute to the speed or extent of the initial mobilization.

VIII. Conclusions and Lessons for the Future

During World War II the U.S. economy was pushed and pulled from hundreds of directions by government agencies. The U.S.

economy came closer to being a command economy than it had been before or was to be afterwards. Some historians have jumped from this fact to the conclusion that the government bureaucracy constructed during the war was crucial to rapid mobilization. Appearances, however, can be deceiving.

The great surge in munitions production, which reached its peak in 1943 at a level that left the axis far behind, was produced by a building boom launched in 1941 and 1942. Resources were drawn rapidly to war production centers by financial incentives and other personal and corporate motives such as patriotism. This happened while price controllers at OPA and production controllers at the WPB were still developing their policies, policies that at OPA were directed more at equity on the homefront than rapidity of mobilization, and policies that at the WPB went from failure to failure well into 1943. Price and production controls, in other words, may have accomplished many things toward the end of the war, but they cannot account for the speed and magnitude of the initial response.

One criticism of this argument, that I have heard repeatedly, is: "You can't say that this was a laissez-faire economy, the government was paying for everything. Without the government nothing would have happened. The government, not the private sector deserves credit for the mobilization." The answer is that I haven't tried to label this as a "laissez-faire" economy. If what one means by a laissez-faire economy is an economy in which the government purchases only a small share of total output, then the war economy

surely fails to qualify.

Nor have I tried to give credit to one sector or another, a fruitless undertaking. Rather the question is how did resources get from A to B? How did workers, in general, find their ways to the munitions factories and shipyards? Were they ordered to go by planners in Washington, or did they go themselves because they thought they would find high paying jobs? In World War II the U.S. relied on wages to draw workers to production centers, and the same could be said for other factors of production. Some economists have characterized the war economy as a "garrison state," a formulation that has its uses. My own preference is to characterize it as a gold-rush economy, a term that captures the essence, I believe, of what was happening in 1941-1943.

What could the United States have done in the 1930s to have prepared better for the war? Obviously, the United States would have been better off had it built more aircraft carriers or a synthetic rubber industry. In the 1930s, however, justifying such expenditures was next to impossible (even leaving aside the widely shared political conviction that preparing for war made war more likely) for the very good reason that ex ante the likelihood of these assets ever being used seemed extremely small.

The government also could have invested more in planning for a war. It could have, for example set up the skeletons of the wartime agencies that eventually emerged, a mini-OPA and mini-WPB, and given them the task of formulating the policies they would follow in the event of war. Compared with building aircraft

carriers and synthetic rubber plants the costs of such planning would have been negligible.

Whether such planing would have been productive, however, is an open question. The one detailed plan made before the war, the War Department's Industrial Mobilization Plan, was ignored. (Smith, 1959, 73-97). Prewar planning, moreover, might well have led to policies similar to those actually followed. The priorities system, which proved to be such a failure during 1941 and 1942, for example, was an extension of the highly praised system attempted in World War I, and would likely have been part of the working plan of any agency set up before the war. It is possible that bureaucrats with a longer tenure in Washington and with more intellectual capital invested in the priority system, might have had a harder time abandoning it.

The Industrial Mobilization Plan, it is true, anticipated the Controlled Materials Plan, suggesting that rationing of basic metals would have been adopted earlier had the Industrial Mobilization Plan been followed, or had civilian planners recommended it before the war. The apparent success of the Controlled Material Plan, however, as we saw above was the result of its being adopted after the shift of resources into the war sector had been achieved and after the supply of basic metals had expanded. There is no evidence that the Controlled Materials Plan would have accomplished a great deal if it had been instituted in late 1941 or early 1942.

Without doubt, the best thing the government could have done

in the thirties to prepare the economy for World War II would have been to have followed expansionary monetary and fiscal policies that restored full employment and encouraged private spending and investment. The economy would have been bigger in 1941, and that would have made for an even more vigorous response.

What are the lessons for future emergencies, say a long drawn out war in the mideast, or even an environmental crisis of similar magnitude? Should we, to be more specific, have in place a skeleton bureaucracy which could immediately be fleshed out and endowed with the power to command resources to go where they were most needed to meet the emergency? The experience of the American economy in World War II, and our thought experiments about what could have been done in the thirties, do not provide an endorsement for such a policy. To the contrary, World War II suggests that where speed is of the essence, it may be best to rely on financial incentives and private markets, to rely on gold-rush economics.

The most important thing the federal government can do to prepare for future emergencies is probably the one suggested by our thought experiment about the thirties: to follow economic policies that increase the size and productivity of the economy.

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PRICES, 1939-46

(1939 = 100)

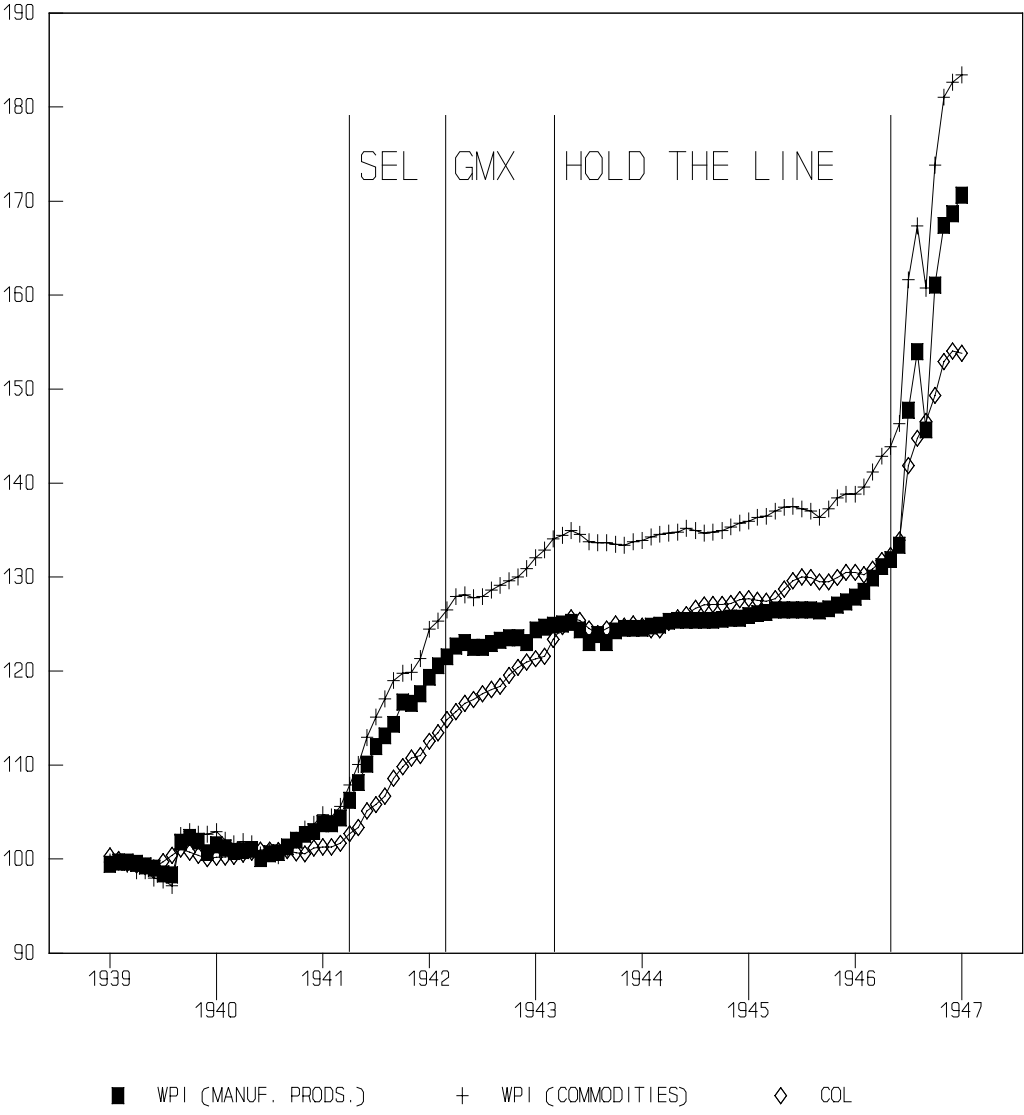


Figure 1

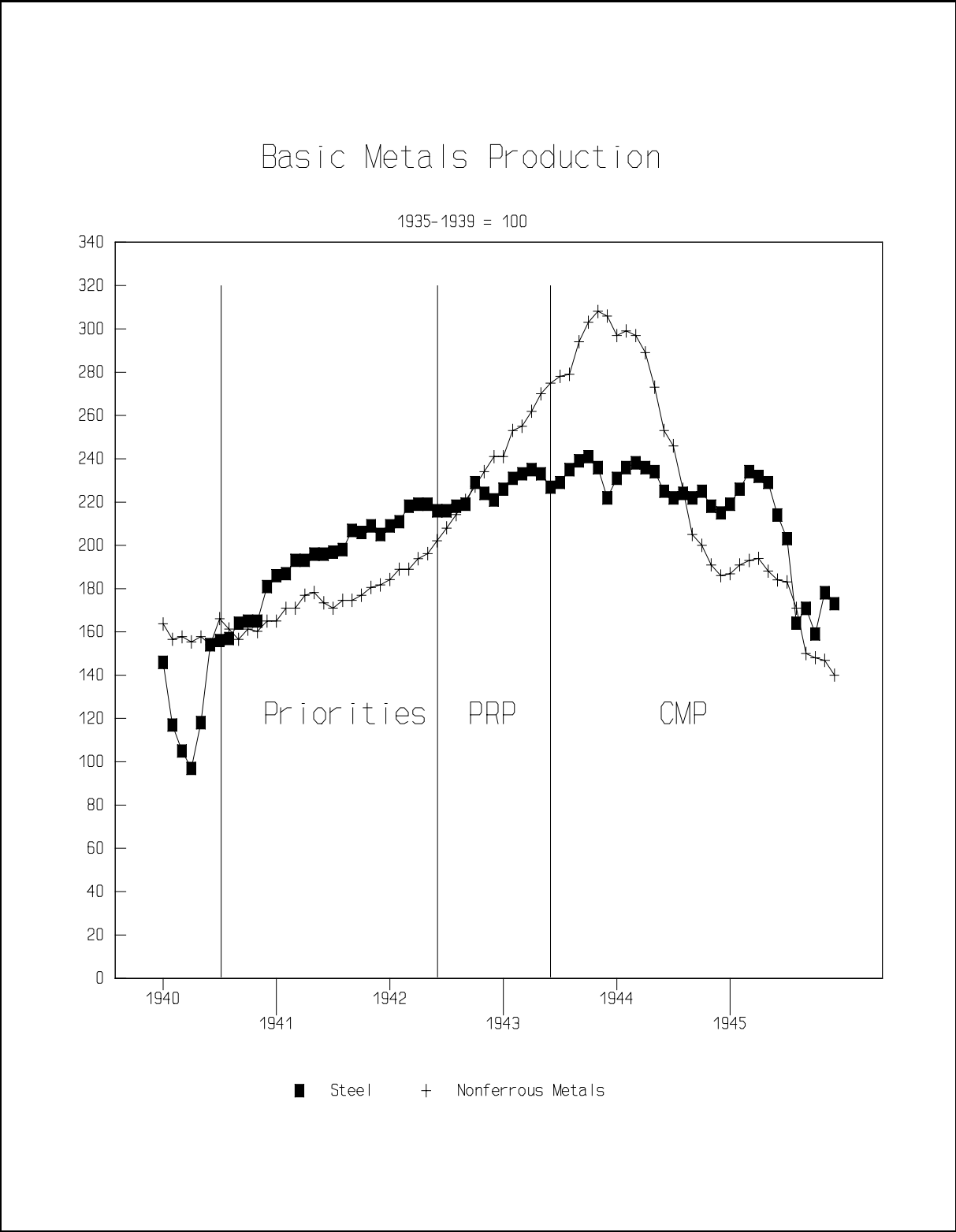


Figure 2

Total Munitions Production in WWII

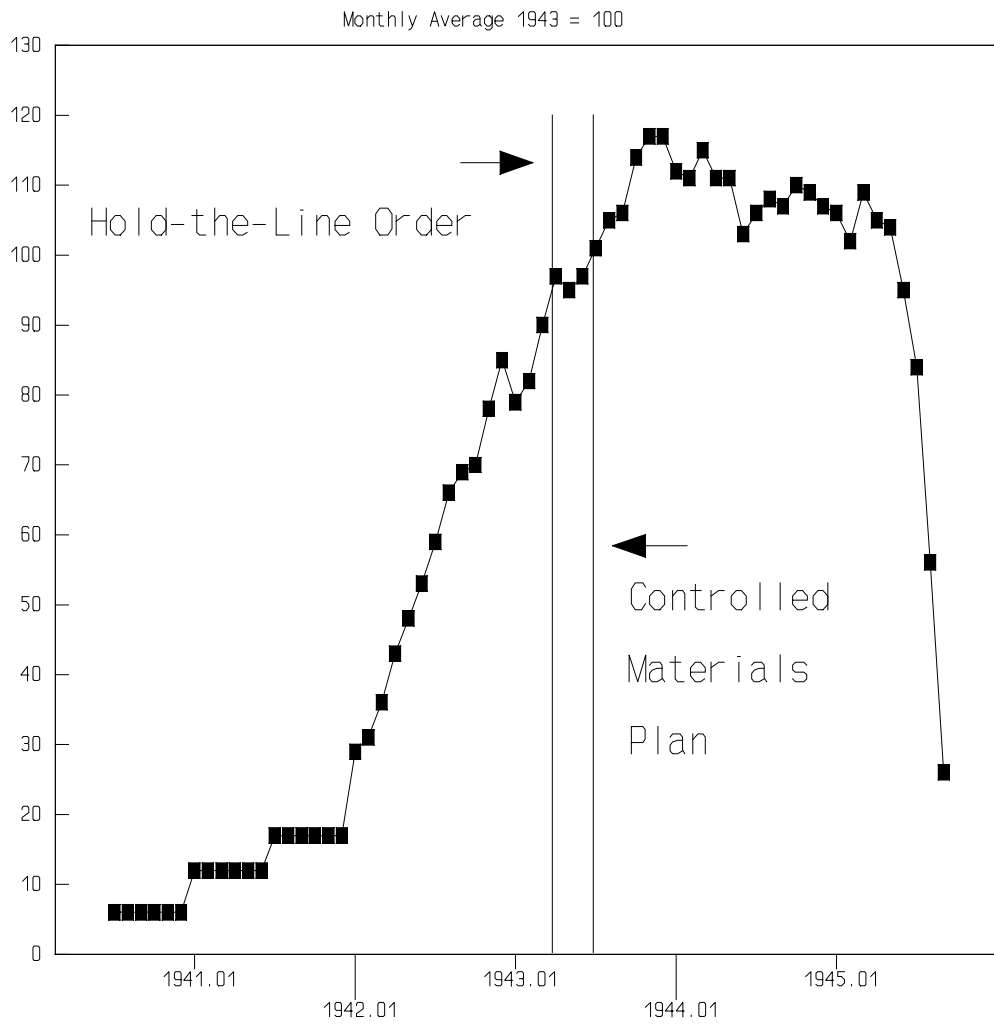


Figure 3

Expenditures on Plant and Equipment

(\$1958 Billions)

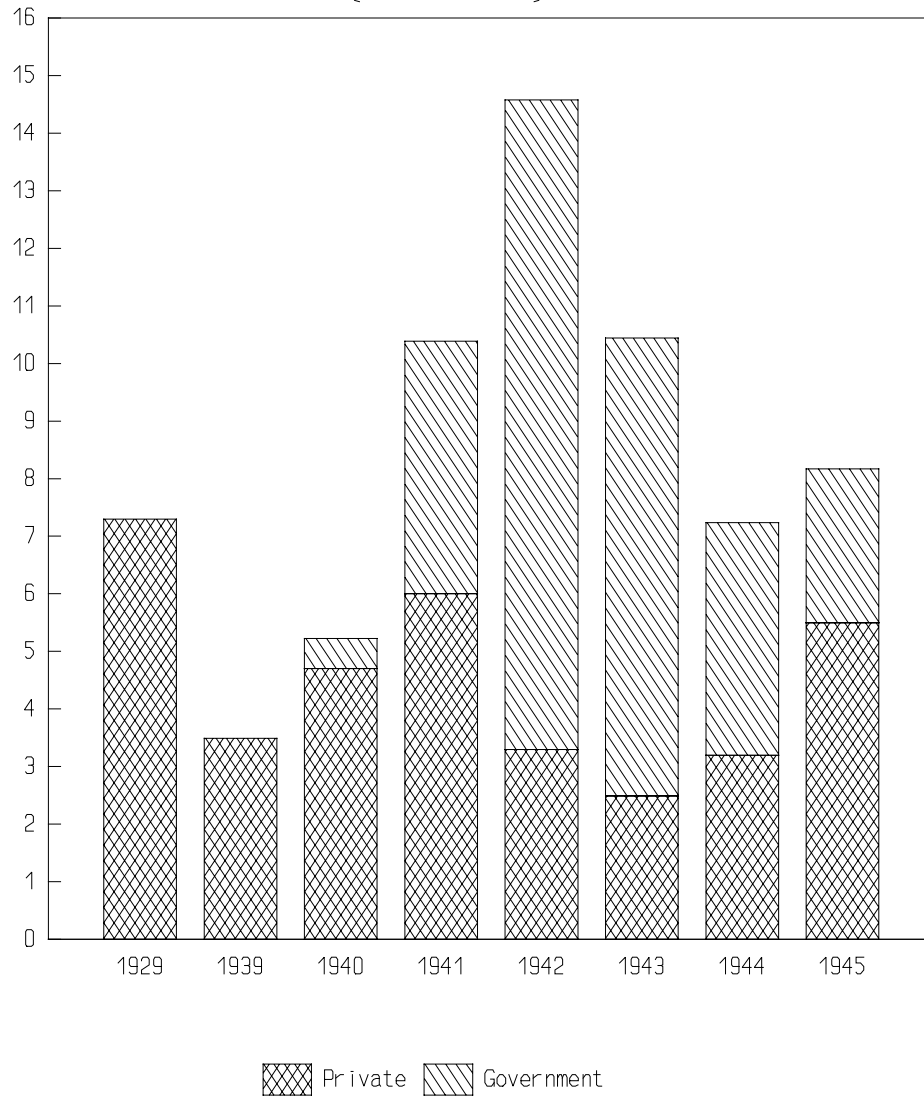


Figure 4

Construction Contracts Awarded

Nonresidential (Value, 23-25=100)

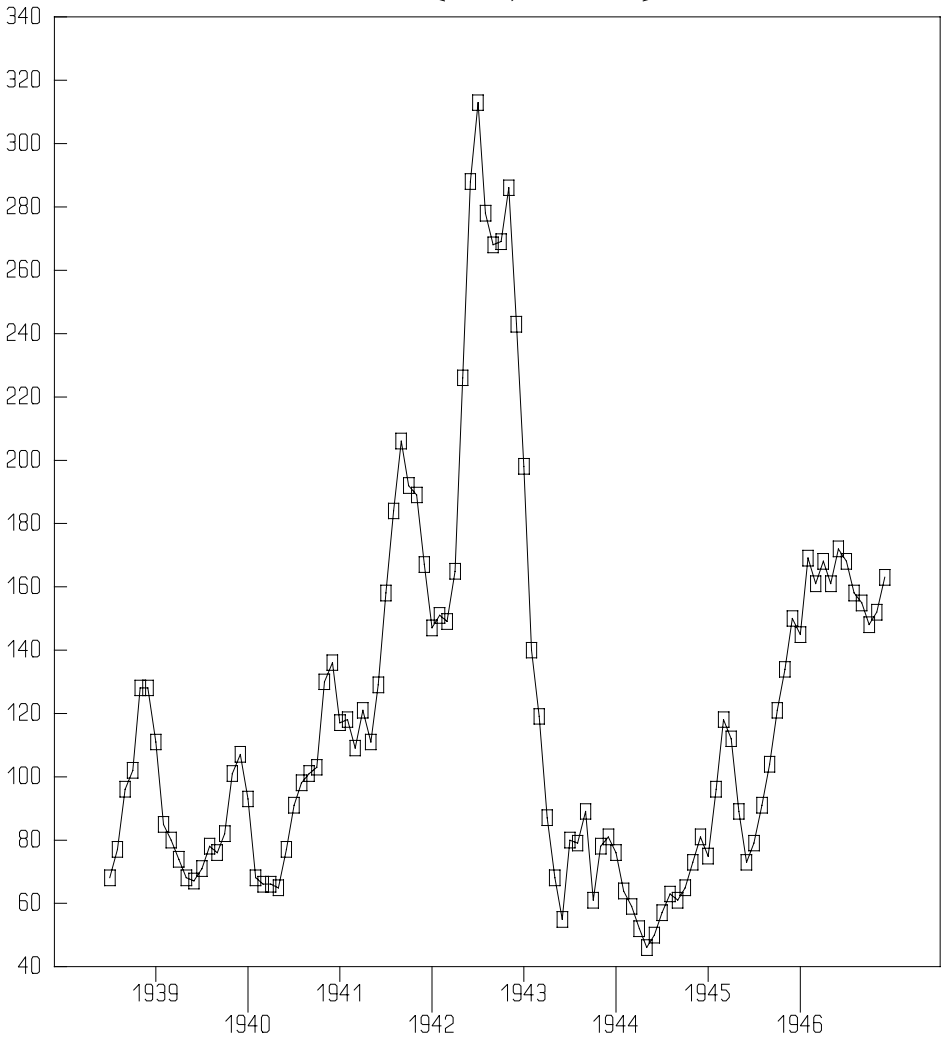


Figure 5

Endnotes

1. An official history of the war agencies lists 158 agencies (U.S. Bureau of the Budget, The United States at War, Appendix I), although this includes separately a number of agencies that were created from one or more existing agencies.
2. In August 1939 Roosevelt established the War Resources Board to survey the availability of resources that would be needed if the nation went to war. The Board was criticized because its members were all businessmen, and it was dismissed in November after it made its report to Roosevelt, a report that was not made public until after the war. Roosevelt's failure to enlarge this start on wartime planning has been viewed as a missed opportunity.
3. Nelson told his story in Arsenal of Democracy (1946).
4. This section is based on chapters 4 and 5 of Rockoff (1984). The main concern of those chapters, however, was the effect of controls on the civilian sector; here I focus on the effect of controls on the speed of the mobilization.
5. The indexes plotted in figure 1 were computed by the Bureau of Labor Statistics and are available in several sources including the Monthly Labor Review and the Federal Reserve Bulletin.
6. Measuring "out of pocket" expenses in multi-product firms turned out to be extremely difficult. So this standard was modified to try to make use of available accounting data.
7. Rockoff (1978).
8. The iron and steel index is from (U.S. Office of Price Administration, 1946, 38-39).
9. The price index for steel, used for the computations in the previous paragraph, probably does not reflect these changes in the composition of output.
10. The data is from various issues of the Federal Reserve Bulletin.
11. Survey of Current Business, February 1945, p. 24, and table S-2 in subsequent issues.
12. Henry Gemery and Jan S. Hogendorn (1993). Earlier, Rapping (1965) found something similar for Liberty ships.
13. The private sector figures are from U.S. Bureau of the Census (1975, 683, series P110); the government figures are from Gordon (1969, 233, table 4).

14. See (Gordon, 1969, 222-23). The figures are only approximate, in part because the figures do not all apply to the same dates.

15. The data is from various issues of the Federal Reserve Bulletin.

16. Knudsen, whose education was in drafting and engineering, emigrated to the United States from Denmark in 1900. He established a reputation as the leading expert on mass production at Ford and General Motors, and became president of General Motors in 1937.

17. Technically, the United States in 1848 was on a bimetallic standard: there was also a fixed price for silver.

18. Corporate profits after taxes (at 1939 prices) rose as follows.

1939	\$6,109	1943	\$9,264
1940	6,836	1944	8,673
1941	5,975	1945	7,611
1942	9,018	1946	10,566

Profits in millions and the GNP deflator are from U.S. Historical Statistics (1976, 925, series V138; 224, series F5).

19. Byrnes (1958), his autobiography, provides some interesting human details, and is consistent with Somers (1950).