After the War Boom: Re-conversion on the Pacific Coast, 1943-49

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One of the most dramatic changes in twentieth-century American history has been the emergence of its Pacific Coast region as a core area of economic activity and innovation. Between 1900 and 1980, the share of the Far Western states (Alaska, California, Hawaii, Nevada, Oregon, and Washington) in national population more than quadrupled, rising from about 3.2 percent to almost 15.5 percent. Its share of personal income more than tripled, increasing from 5.3 percent to about 17.4 percent. By 1980, the leading urban areas of the Pacific Coast of the United States-- Los Angeles, the San Francisco Bay Area, and Seattle--gained worldwide recognition as centers of high technology.

Much of the traditional historiography treats the region’s experience during the Second World War as the watershed event in its twentieth-century growth. For example, Gerald Nash’s influential work argued that World War Two represented a fundamental discontinuity in the West’s development and that wartime defense contracts and facility investments were the driving forces in the Pacific states’ rapid transformation from an stagnating economic “colony” of the industrial Northeast into a dynamic pace-setting region.¹

There has been little or no argument that the West experienced a dramatic, disproportionately rapid expansion over the early 1940s. Indeed contemporary observers referred to the wartime boom as the region’s "Second Gold Rush." Civilians migrated west in unprecedented numbers to fill jobs in the region's burgeoning aircraft and

¹Gerald Nash, World War II and the West: Reshaping the Economy (Lincoln: Univ. of Nebraska Press, 1990).
shipbuilding industries. In addition, military facilities in the region were home-base for thousands of soldiers and sailors engaged in the Pacific campaign. Between 1940 and 1945, the region’s total population increased by 2.7 million persons, or by over one-quarter. Nor is there much disagreement that the “engine of growth” was military spending. Between June 1940 and June 1945, the Far Western states received about $27 billion in federal government spending for war supply contracts and facilities investments. This accounted for close to one-eighth of the national total, roughly twice the region’s pre-war share in population or manufacturing employment.

Yet there has emerged a vigorous debate about whether the Second World War represented such as fundamental discontinuity as the Nash thesis suggests.2 Recent studies have pointed to evidence of stability in the region’s political and economic structure and to the roots of the region’s wartime growth in its pre-war economic development. This paper attempts to advance and move beyond the continuity/discontinuity debate by examining the Pacific region’s economic experience in the immediate post-war period (1945-49). It argues that the conversion process, which has been unduly neglected in the recent debate, was crucial for region’s consolidation of the transitory gains during the war into permanently higher levels of economic activity.

After military spending peaked in 1943, fears spread throughout the West that the region’s postwar economy would not provide sufficient jobs for its greatly enlarged labor force. Serious economic disruptions were widely foreseen. In California, responsible authorities estimated that one million workers--out of a labor force of about four million--would be unemployed one year after demobilization. In response to these challenges, public agencies such as the California State Reconstruction and Reemployment Commission sought to plan for orderly conversion to a peacetime economy. In addition, business groups and local officials lobbied the federal government and eastern firms to keep the West's new steel complex and other "war winnings" in operation.

The transition did not prove as difficult as most observers had anticipated. The unemployment rate in the immediate post-war period generally remained in single digits and the expected out migration did not occur. Instead, the enlarged western market

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induced a rapid inflow of new branches of national manufacturing firms and an expansion of existing operations. Many war workers and plants shifted quickly to supply civilian markets. The demands for housing, schools, and services, left unfilled during the war, fostered vigorous job growth in construction, trade and other services. By 1950, the Pacific region's employment structure returned to its pre-war composition, though at a significantly larger scale.

Drawing inspiration from the New Economic Geography literature, as well as from the traditional historiography of the West, the paper argues that strong “home market effects” account for the relatively easy conversion experience on the Pacific Coast. Based on an empirical investigation of the long-run relationship between manufacturing production and the size of the region’s market, this study finds surprising support for the highly speculative claims that the region’s economic structure could support multiple equilibria and that the transitory shock of military spending during World War II helped push the Pacific Coast economy from a “low-level” equilibrium to a “higher-level equilibrium consistent with the same fundamentals.

This paper has the following form: the next section briefly examines the nature and effects of the war boom on the West Coast economy. Section 3 discusses local conversion planning efforts, with a focus on wartime expectations about the post-war size of the Pacific Coast population, migration flows, employment levels, and unemployment rates. The following section details how the actual post-war experience unfolded and explores how the expansion of the home market made the transition easier than anticipated. The fifth section uses a new data set on California manufacturing to put the WWII episode into historical context by examining the long-run relationship between the growth of the region’s industrial output and the size of the local market. The final section concludes.
The War Boom

There is no question that World War Two led to an intense economic boom on the US Pacific Coast. As Table 1 shows, the federal government spent about $23.5 billion in major war supply contracts and $3.5 billion for military and industrial facilities in the region between June 1940 and June 1945. California led the way, receiving $19.7 billion or a little less than three-quarters of the region’s total expenditures. The West Coast's share of national military spending—11.8 percent—well exceeded its 1940 share of the nation's population and its 1939 share of the nation's manufacturing wage-earners. But it is important to note that most of the wartime contracts were for aircraft (roughly $12 billion) and ships (about $9 billion), activities in which the region demonstrated significant comparative advantages before the attack on Pearl Harbor.

The wartime boom led to a 61 percent increase in non-agricultural civilian employment in the Pacific region between 1940 and 1944. A picture of the employment trends in the region as a whole and in its largest state, California, is offered in Table 2. The expansion of the manufacturing sector led job growth in the region. The construction and government sectors tended to keep pace with the overall expansion; most other sectors grew in absolute but not relative terms. (Mining was an exception. Employment in that sector declined by about 26 percent.) During the war, the region’s manufacturing sector added about one million workers as employment increased from 623 thousand workers in the 1939-40 period to 1,615 thousand in 1943-44. This two-and-one-half fold increase accounted for over 60 percent of the overall expansion of non-agricultural employment over the period.

Driving this enormous growth in western manufacturing was the military’s high demands for the products of the region’s aircraft and shipbuilding industries. During the war, Pacific Coast aircraft plants accounted for about 38 percent of the nation’s planes;

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4Major sectors of the economy such as agriculture, construction, trade, and services grew little in absolute terms during the conflict; the labor force in finance, insurance, and real estate actually declined.
its shipyards built about 44 percent of the government’s merchant ships. To meet the military’s demands, employment in West Coast shipyards soared from less than 7 thousand in 1939 to over 515 thousand at the peak in the summer of 1943. The number of workers in the region’s aircraft plants climbed from about 25 thousand in 1939 to about 315 thousand in the summer of 1943. Together these sectors accounted for about one-half of the total expansion of non-agricultural employment in the Pacific region between 1940 and 1943. Associated with the enormous growth of these high-wage “war industries” were increases in the region’s wages relative to the country as a whole. For example, the hourly wage in California manufacturing rose from 114.9 percent of the national average in 1939-41 to 120.7 percent in 1943-45.

The expansion of employment opportunities resulted in dramatic reductions in unemployment, substantial increases in labor force participation, especially of women, and significant inflows of population. The region’s jobless rate, which languished in double-digit levels on the eve of the war, fell to a less than one percent by 1944. Unfortunately we lack comprehensive data of the level and rate of unemployment in the Pacific Northwest, but the high-quality monthly series available for California (displayed in Figure 1) probably can serve as a useful proxy for movements in the region as a whole. As the Figure shows, the state’s unemployment rate fell from 15.2 percent in January 1940 to 8.1 percent in December 1941, and to the incredibly low rate of 0.3 percent in October 1943. This meant that out of a labor force of 3908 thousand workers, only 12 thousand were without jobs. The region’s labor market became so tight that the war authorities declared Los Angeles, Portland-Vancouver, San Diego, San Francisco-Oakland, and Seattle-Tacoma “congested production areas” and placed restrictions of new procurement activity.


6 Officials at the Federal Reserve Bank of San Francisco noted: “More than any other industry, shipbuilding has been responsible for the vast increase in population and employment on the Pacific Coast since 1940, and its demand for materials and supplies has been the principal factor responsible for the rapid expansion and development of the heavy metals and metal working industries in the (12th) District.” Monthly Review, (May 1944) p. 21.

Well before the market became this tight, western employers sought out new sources of labor. Migrants from the Dust Bowl, who has been unwelcome in the 1930s, were now actively recruited. Housewives, students, retirees, and others discouraged from work by a decade of depression, were drawn into the labor force. These forces more than offset the region's losses due to military enlistment and conscription. According to estimates from the US Bureau of Labor Statistics, the total labor force on the Pacific Coast (including the armed forces) rose from about 4,268 thousand in April 1940 to 5,859 thousand in April 1945, an increase of 37.3 percent. This compares with a national gain of 20.5 percent. Of the 1,591 thousand added workers, natural increase accounted for only 92 thousand workers or about 6 percent; the participation of ‘extra workers’ added 652 thousand, about 41 percent of the total. Interstate migration made up 53 percent of the increase, some 847 thousand workers. Of this number, an increase of 410 thousand would have been expected if interstate migration over the 1940-45 period maintained its 1935-40 volume. The Bureau concluded that ‘abnormal’ migration accounted for 437 thousand added workers (or about 27 percent of the labor force growth). Most of the wartime interstate migrants came from the West North Central (32 percent), West South Central (20 percent), and Mountain (20 percent) regions, where the expansion of economic opportunities did not keep pace with the Pacific region.

As a result of this surge in migration, World War Two was a period of vigorous population growth on the Pacific Coast. Between July 1940 and July 1945, the region’s civilian population expanded from 9,678 thousand to nearly 11,300 thousand residents. The total increase in the civilian population actually understates the migration flow because the withdrawn of the region’s residents into military service is ignored. Net in-migration to the region totaled almost two million people (1984 thousand) over the 1940-45 period. At the peak, more than six hundred thousand people moved to the Pacific Coast each year.

When the war ended, the region’s population and labor force were significantly larger than before. In addition, millions of footloose servicemen and women awaited demobilization. But the region’s industrial structure, expanded in such a rapid and

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unbalanced matter during the war, faced serious problems of re-conversion. The leading question was “Where will all these people find jobs if they stay in the West?”

Contemporary expectations

Western business, labor, and political leaders became highly concerned about the region’s post-war prospects. In part, this reflected the nationwide apprehension that the depressed conditions of the 1930s would return. But the local leaders had additional reasons to worry. The war boom had attracted so many new workers, workers without strong roots in the region, workers with a history of moving on. If jobs were unavailable in the post-war period, these migrants might either return home or, if they remained, become public charges.

Also, the war boom had been so highly unbalanced with most of the expansion in a few sectors—aircraft and shipbuilding—that were bound to contract sharply once the War was over. As local observers often noted, “re-conversion” was a misnomer on the West Coast. Many of the Pacific Coast factories had not converted from peacetime production to contribute to the war effort but had been constructed as the conflict raged. When it has over, these plants would either begin to compete in the civilian market for the first time or shut down. Adding to these concerns was the possibility that victory in Europe might precede victory in Japan by many months or even years and the West Coast would remain on a war footing long after the “normalcy” prevailed in the rest of the nation. Manufacturers in the East and Midwest would be able to capture the post-war civilian markets before the western plants had a chance to convert.

The region began to prepare for peace well before the War was won. In 1943, the California legislature established the State Reconstruction and Re-employment Commission to

develop the natural, social, and economic resources of the State, promote development of new industries, create new markets; promote the reemployment of discharged servicemen and readjustment to displaced war workers, and the conversion of industry

and commerce from war to peace standards; to provide for post-war adjustment and reconstruction, and to encourage economic and social improvement of the general public.10

In the Pacific Northwest, the strong regional planning staffs, set up during the New Deal, were themselves converted to plan for post-war development.11 The staff of the 12th district Federal Reserve Bank also lent a hand to the conversion effort.

Up and down the coast, business, academic, and government organizations began to sample, survey, plan, and predict. Among the key issues were how large would the region’s post-war population and labor force be. To answer these questions, the planners and prognosticators wanted to know how many of the recent entrants into the labor market would remain and how many veterans would return. So, for example, in early 1944 the Kaiser interests conducted a massive survey in the Portland area, drawing responses from over 80 thousand war workers. They found that about 52 percent of the respondents who had migrated with the past three years intended to remain in the area after the war. Of these, about 41 percent were definite in their intention to stay and other 59 percent intended to stay if they found work. Based on this study, Emory Worth of the Oregon State Manpower Commission estimated that roughly 40 thousand in-migrant workers, representing about one-eighth of the 1944 labor force, would remain in the Portland-Vancouver area after the war.12 Glossing the numerous surveys conducted in Washington State, N. Engle found that “about half” of incoming war workers “definitely want to remain in the State” and that between 44 and 48 percent of working women expected to drop out of the labor force after the war.13 Adding the state’s 115 thousand

returning veterans, Engle estimated that Washington’s post-war labor force would be larger by 339 thousand workers, or by 36 percent, than in 1939.

California authorities were confident/concerned that the golden state would keep a larger share of its recent migrants. The State Reconstruction and Reemployment Commission declared in early 1944 that “(i)n no event is the State expected to lose even temporarily more than one-quarter to one-fifth of its wartime migrants, while a net population loss by 1950 is considered highly unlikely.”14 They estimated that in “194X” – the first year after demobilization—California’s population would be between 8330 and 8750 thousand and that in 1950 the state would likely have a population of 8500 to 9000 thousand.15 O. Wheeler, Director of Research at the 12th District of the Federal Reserve Bank, offered the following tentative generalizations regarding the West as a whole: “well over half of the in-migrants intend to remain in the region, at least if they can find jobs…A third or more of the former housewives apparently wish to continue working.”16

In early 1945, authorities on the coast received more worrying news—not only did their own veterans plan to return, but unexpectedly large numbers of veterans from other states hoped to join them. The news came from a US Army study of the post-war migration plans of enlisted men conducted in the summer of 1944. Most enlisted men nation-wide (82.7 percent) stated they intended to return to the region from which they came; four-fifths said they would return the same state. In the national sample, 10.8 percent were undecided about where to locate and 6.5 percent planned to return to a different division from their prewar residence. Of this 6.5 percent, over one-quarter stated they intended to move to the West Coast. This was a greater share of movers than any other region attracted. Re-inforcing this westward flow was the fact that enlisted men from the Pacific region were more likely than those from any other region to be “homeward-bound.” Nearly nine out of ten intended to return to the West Coast and only 3.6 percent planned to move away. According to the authors of the study, the net effect

of the movement of servicemen would be “a rapid expansion in the Pacific coast states.”

This gave greater impetus to local efforts to gauge the extent of employment and unemployment during the conversion period. The conventional wisdom was that employment in the “war industries” would fall to less than one-tenth of its wartime peak. For example, a 1944 study of Pacific Coast shipyards by the Federal Reserve Bank of San Francisco indicated that the region’s shipbuilders expected to have 40 thousand employees in an “ordinary year with good business” and only 16 thousand in an “ordinary year with bad business.” In 1943, the sector employed 515 thousand workers, implying that roughly one-half million workers would be laid off in the conversion process.

In combination with the Committee for Economic Development, the Bank conducted a more comprehensive survey of Pacific Coast manufacturing firms regarding their “postwar intentions” in the spring and summer of 1944. They asked how much employment the firms were currently providing and how much they would offer in the postwar period under “good economic conditions” and under “bad conditions.” The findings are summarized in Table 3. Overall, the region’s manufacturing firms expected to employ around 780 thousand workers if times were “good” and about 500 thousand if times were “bad”. The former represented an increase of about 40 percent from the actual 1939 level of employment, but a reduction by one-half from the 1943 peak. The

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17 Abram J. Jaffe and Seymour L. Wolfbein, “Postwar Migration Plans of Army Enlisted Men,” *Annals of the American Academy of Political and Social Science*, Vo. 238 (March 1945), pp. 18-26. The veterans were presumably more footloose than most other members of the US population. They were generally in the age categories associated with higher levels of geographic mobility, had already been detached from their family’s traditional home, and had acquired federally subsidized access to housing markets and educational institutions nationwide through the 1944 Servicemen’s Readjustment Bill (the GI Bill).
18 Federal Reserve Bank of San Francisco, *Monthly Review* (Dec. 1944) p. 64. The estimates for post-war employment even under bad conditions were above the 1939 level of 6.5 thousand workers in the West Coast yards.
19 Actually, many workers, understanding the industry’s limited post-war prospects, “left early” to seek other employment opportunities. These departures and difficulties in attracting workers to the industry’s dead-end jobs added to the shipbuilders’ problems of completing work during the war.
latter figure was even below the pre-war level. Manufacturers in Oregon and Washington appeared more optimistic than did those in California. The most notable sign of this difference was that the manufacturers outside of the aircraft and shipbuilding industries in the Pacific Northwest expected that under “good conditions” they would hire more workers than they did in 1943 whereas those in California expected their employment to decline.

The California State Reconstruction and Re-employment Commission painted an even more pessimistic picture of the state’s post-war prospects. It estimated the civilian labor force in “194X” would be between 3600 and 4000 thousand workers. With “the smoothest readjustment and the highest possible levels of business activity,” there would be 3200 thousand civilian jobs within a year of demobilization, but with moderately adverse conditions, only 2800 thousand jobs. In any case, employment would be below the 1943 peak of 3500 jobs and it would require 3-4 years of normal growth to recover to this level. According to a Commission report published in late 1944, unemployment in “194X” California would range between 365 and 1200 thousand, with the most likely prospect between 450 and 800 thousand workers.\(^{21}\)

As the war progressed, responsible authorities in the state became still more pessimistic about the extent of unemployment. In 1945, Samuel May, Director of the Bureau of Public Administration at the University of California, estimated that total unemployment in California at the end of the first year of demobilization (assumed in his study to be 1946-47) would range between 905 and 1085 thousand, levels he found “startling.” The main reason for the difference from the State Reconstruction and Reemployment Commission figures was that 200-350 thousand veterans from other states were now expected to move to California after the war. May anticipated that the state’s labor force would be higher than in 1943 by 670 thousand workers and employment lower by 315-490 thousand. Overall, California employment would be in the range of

\(^{20}\)“Postwar Intentions of Pacific Coast Manufacturers,” Federal Reserve Bank of San Francisco, Monthly Review (Feb. 1945), pp. 17-20. As the Fed economists noted the survey covered only existing firms and, therefore, missed any increase in activity planned by potential new entrants.

2955 to 3130 thousand workers, implying about one-quarter of the labor force would be unemployed.22

The Post-War Experience

What actually happened after the war? How did the experts’ predictions measure up? As revealed in the data in Table 2 above, the region’s readjustment proved far easier than most of the responsible authorities predicted. Contemporary observers were stuck by two phenomena: (1) overall employment recovered so rapidly—as a writer at the Federal Reserve Bank put it in mid-1946 the region experienced a loss of 45 percent of its manufacturing jobs “without collapsing or, indeed, showing any signs of distress”; and (2) the employment structure at a broad (1-digit SIC) level almost immediately returned to its pre-war composition—repeating a common refrain, a 1948 Fed article noted: “the distribution of workers among major industry groups is now not markedly different than before the war. Little trace remains of the wartime pattern of employment.”23

As many contemporaries noted, the adjustment process began before the conflict ended with employment in the “war industries” falling gradually from 1943-44 on. Nonetheless, the cutbacks after VJ-day hit the West Coast hard. In the four week period after 15 August 1945, more than 300 thousand workers lost their jobs. Most of the decline resulted from the termination of about 100 thousand shipyard workers (out of 385 thousand employed) and 75 thousand aircraft worker (out of an initial employment of 185 thousand). Over the next six weeks, another 100 thousand workers were laid off, again mostly in the high-paying “war industries.” By the end of 1945, total employment in the

22 A second later set of estimates by May’s organization put the expected number of jobless Californians in mid-1946 in a range between 826 to 1256 thousand workers. These estimates were made independently by an industrial engineer, Alfred Norris, as a check on May’s figures. The differences from the estimates of May and the State Reconstruction and Reemployment Commission were chiefly due to greater estimated flows of returning veterans, which resulted in higher labor force numbers (4004-4157 thousand) than the earlier studies. US Senate, Hearings Before the Special Committee to Study and Survey Problems of Small Business Enterprises, 79th Cong., 2nd Sess., Part 86 California Looks to Its Economic Future: II, Field Hearings Fresno, Calif., Feb. 25, 1946 (Washington, DC: GPO, 1946), p. 9828.
region’s aircraft and shipbuilding industries fell to about 280 thousand, down from 750 thousand at the start on the year.24

Unemployment started to climb. By February 1946, the jobless rate in California entered double-digits for the first time since 1941 (See Figure 1). But the situation quickly improved. Both the number of unemployed persons (485 thousand) and the jobless rate (11.6 percent) peaked in April 1946. By summer, the state’s unemployment rate again dropped into single-digit levels and remained in the 5-8 percent range until the 1949-50 recession. Comparable data do not exist for Washington and Oregon, but the available information suggests that the unemployment rate in the Pacific Northwest was slightly higher than in California in the last years of the war and slightly lower in the late 1940s. Estimates of unemployment in the three Pacific Coast states from the US Employment Service indicate that the number of unemployed in the region peaked at 725 thousand in March 1946 and fell to about 600 thousand by May. The latter approximately matched the pre-war (April 1940) level when the labor force was about one-third smaller. Obviously unemployment in the conversion period was substantially higher than the wartime low of around 100 thousand (in 1943-44) and the region’s unemployment rate remained several percentage points higher than the national average. But joblessness in the post-war period was far below expectations and never threatened to bankrupt the region’s unemployment compensation systems as had been feared.25

One reason that unemployment was not higher was that the inflow of out-of-state veterans to the West proved to be smaller than most of the wartime studies had predicted. In 1947, the Current Population Survey estimated that about 1301 thousand WWII-era veterans lived in the Pacific region, only about 80 thousand more than resided there prior to entry into active service.26 The region continued to receive a positive, albeit smaller, inflow of migrants. Between July 1, 1945 and July 1, 1947, the civilian population of the Pacific Coast increased from 11,700 thousand to 13,551 thousand. Of this increase,
migration accounted for about 342 thousand. The post-war surge in family formation led the rates of natural increase to reach unprecedented levels; a surplus of births over deaths accounts for over four-fifths of the region’s population growth.

Overall, non-agricultural employment in the three Pacific Coast states fell by 290 thousand workers, or about 7 percent, between 1944 and 1946. But the 1946 level was still 50 percent above the 1940 level. Most of the decline appears to be due to the voluntary withdrawal of the ‘extra’ workers—housewives, students, and retirees—from the labor market. The decline, moreover, was only temporary. By 1950, non-agricultural employment in the region surpassed even the wartime peak.

How could the Pacific Coast’s economy sustain its greatly enlarged labor force and population after the war? It is useful to frame the issue in a simple demand and supply model of the labor market. During the Second World War, the Pacific Coast experienced a dramatic shift out in labor demand in its “war industries”, which led to the expansion of its labor force. After 1943, the military demands began to diminish, but employment did not fall as much as predicted. Why did the wartime reallocation of aggregate income and employment “stick”? There are several possible explanations and I would not like to fall into the trap of insisting that only one is valid.27

One possible explanation is that the wartime stimulus did not really end. The emergence and growth of the military-industrial complex during the Cold War period is a familiar theme in the economic history of the recent past. It is well understood that military procurement became geographically concentrated along the so-called “Gun-Belt” along the Atlantic, Gulf, and Pacific Coasts.28 That said, it is important to note that

27 Neither 1939-40 nor 1943-44 were periods sustaining long-run full-employment equilibrium in the labor market. The 1939 economy was arguably operating at far less than full capacity due to deficient aggregate demand. Perhaps the best indication of the accuracy of this characterization is how rapidly output increased and unemployment fell once the wartime demand kicked in. Another interesting sign about the state of the pre-war labor markets is how they responded to the increases in military demands, which were primarily for durable manufactured goods. The so-called war industries typically saw large increases in employment but smaller relative increases in wages than the so-called non-war industries. The existence of a pool of underemployed labor (particularly in the rural areas on the West Central region) during the pre-war period also helps explain the high degree of responsiveness of migrants to the job opportunities opening on the Pacific Coast during the war. The 1943-44 peak was not the ideal candidate for a period of long-run equilibrium either. By this point, the War Labor Board imposed restrictions on how high wages could be increased. Even earlier, plant allocation decisions and materials controls led to the contraction of activity in many activities.

28 As late as 1996, the Pacific region received 21.6 percent of the DOD Contract Awards and 21.6 percent of military payrolls, which was disproportionately larger than its share on national economic activity.
military spending declined sharply after WWII as Figure 2 displays. By 1945, real expenditures for defense expenditures reached the unprecedented and, indeed, probably unsustainable sum of $139 billion (in 1958 dollars). Between 1945 and 1948, US military spending contracted by $127.6 billion or 92 percent. (By way of contrast, the post-Cold War defense contraction from 1989 to 1996 was only 29 percent; even in absolute terms, the recent drop of $20.9 billion was dwarfed by the 1945-48 decline.) While data on the regional allocation of defense spending for the 1946-50 period are not readily available, it is certain than spending in the Pacific region was far lower than at the wartime peak.

A reading of the West Coast business press in the immediate post-war period reveals that virtually no one considered military spending a suitable permanent foundation for the region’s economy. While there were expressions of concern that the post-war contraction was too rapid, most business writers placed their faith in the private sector. To the extent that the local business community demanded government intervention, it was to combat freight rate discrimination, help establish western basing points for steel prices, and to sell off war surplus facilities in an orderly manner. Nothing in the experience of West's business leaders suggested that the region’s long-term economic growth could be based on military sales and few realized that defense demand would remain permanently higher until the beginning of the Korean conflict.

Between 1945 and 1947, the region’s aircraft industry suffered a severe contraction but soon activity stabilized at a level far above pre-war production. By 1948, the Pacific Coast industry was already in the black, due to a resumption of military orders and successful re-conversion of a part of the industry to civilian production. One important trend accompanying the industry’s post-war contraction was its re-concentration on the West Coast. A glimpse of this process is offered in Table 4, which shows the floor-space of airframe place in 1940, 1944, and 1948. Before Pearl Harbor roughly one-half of the floor-space was on the West Coast. During the War, the military authorities induced the leading West Coast firms to build and operate large plants in the mid-continent region. Although the share of national aircraft floor-space (and

production) located on the West Coast fell to about one-quarter, the share “managed” by West Coast firms remained roughly constant. After the war, the West Coast firms shut down almost all of the mid-continent branches and the West Coast share climbed back to about one-half of the national total.

By way of contrast to the aircraft industry, Pacific Coast shipbuilding virtually collapsed after VJ day (see Figure 3). By early 1947, the region’s private and navy yards split evenly the sector’s labor force of 65 thousand workers. For several years after mid-1947, industry received no orders for new ships and performed only repair work. By early 1950, employment had fallen to about 32 thousand. Although the industry recovered slightly during the Korean conflict, Pacific Coast shipyard activity never again approached one-tenth of the 1943-44 levels. In summary, military demand in the immediate post-war period, while higher than before the war, was far below the wartime peak.

A second alternative explanation for the continued high employment level is that migration is costly. Once people had made the investment to move west in response to the wartime boom, they would not automatically move back home when the boom ended. The elasticity of labor supply in response to the expansion of demand was higher than that in response to the contraction, implying the temporary boom had a ratchet effect on the region’s labor force. This argument has some plausibility. But in combination with a decline in labor demand in the “war industries,” it implies that relative wages would have to fall dramatically to sustain employment. The available evidence suggests regional wages did decline, but the movements were surprisingly mild. In California, for example, the hourly manufacturing wage fell from 120.7 of the national average in 1943-45 to 114.0 in 1947-49. The latter figure was 0.8 percentage points below the ratio prevailing in 1939-41. Given the conventional estimates of own-price elasticity of demand for labor (say –0.75), this change would account for only a trivial fraction of the relative increase in the state’s employment, holding the labor demand constant.\textsuperscript{30}

The complete explanation must then include an increase in relative labor demand from a source other than the military. It could be due to an increase in demand for the region’s exports, which included principally agricultural and wood products and nonferrous metals. But between 1943 and 1946, aggregate employment in these activities actually declined in both California and the Pacific Northwest.

The second and more promising candidate for an expansion of demand was the region’s home market. The wartime boom had increased the real income on the Pacific Coast by almost 77 percent between 1940 and 1945. The region’s share of national income rose from 9.7 percent to 11.9 percent and its share of national population rose from 7.4 percent to 8.9 percent. But the wartime controls and labor market conditions slowed economic adjustments to meet the enlarged civilian demands.

The robust growth of the national economy in the immediate post-war period is commonly attributed to pent-up demand, to the combination of large levels of private savings built up during the war and of small existing stocks of consumer durables and housing following a decade-and-a-half of limited purchases. By most measures, pent-up demands on the West Coast were especially intense. During the early 1940s, the region’s per capita income became the highest in the nation, contributing to the rapid accumulation of liquid assets. For example, per capita sales of war bonds on the Pacific Coast were consistently 25-30 percent higher than the national average. Between 1941 and 1945, the region’s residents purchased over $4.5 billion Series E Savings Bonds, accounting for about 11.6 percent of national sales. Other forms of liquid savings also rose dramatically over the war. Between the end of 1939 and the end of 1945, bank deposits on the Pacific Coast rose from $5.2 billion (7.6 percent of the national total) to $17.0 billion (10.3 percent). When this spending power was released, a tremendous boom resulted.

Despite the huge flows of migrants, civilian construction virtually stopped on the West Coast in the war years. By 1943-44, acute housing shortage appeared in most of the leading urban centers. When controls were lifted after mid-1945, the region enjoyed an extremely vigorous residential construction boom. Table 5 displays the real value of

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authorized construction in urban areas on the Pacific Coast from 1943 to 1950. As it shows, real construction spending in 1947-48 as roughly three times the 1943-44 level. And as Table 2 reveals, over the 1944-48 period, the building sector added 92 thousand employees in the Pacific region as a whole, almost all in California.

Even larger and more immediate changes occurred in the trade and service sectors. These activities had not kept pace with the expansion during the war. Indeed, many small retail and wholesale establishments closed due to materials and labor shortages. For example, in California the number of retail stores licensed by the state (to collect sales taxes) declined from 250 thousand in 1940 to under 174 thousand in 1943. After the war peak, the number bounced back, increasing to 251 thousand in 1946 to 278 thousand in 1948. In Washington State, it was reported that 1500 trade establishments per month were started in the late 1945 and early 1946. Again referring to Table 2, the West Coast trade sector added nearly 238 thousand jobs between 1944 and 1948 and the service sector (including Finance, Insurance, and Real Estate) nearly 138 thousand. The bulk of these increases occurred in California where employment in the trade expanded by 177 thousand and that in services by 108 thousand.

Finally although employment in the manufacturing sector fell sharply in 1945-46, almost all of the contraction was in shipbuilding and aircraft. Many of the other so-called “war industries” such as chemicals, petroleum, rubber tires, and automobiles recovered quickly after their initial cutbacks. And the growth in the “non-war industries” offset the decline in the “war industries” to a far greater extent than was expected. Table 6 presents data on the number of production workers on the Pacific Coast by major industry group for 1939, 1947, and 1950. As it shows, even excluding aircraft and shipbuilding, manufacturing employment on the West Coast increased by almost 70 percent between 1939 and 1947. The industrial groups typically associated with larger scale (SIC 28-30, 33-38) generally experienced faster growth.

At a conceptual level, we may distinguish three ways--called here “multiplier,” “accelerator,” and “threshold” effects--in which local production may depend on the local market. In the first, based on the familiar “multiplier” mechanism of macroeconomics,

the level of local production increases roughly proportionately with the size of local income or population. This relationship appears to characterize trade, much of the service sector, and manufacturing activities such as printing or the processing of perishable foods. In proximate terms, the “multiplier” relationship probably explains most of the expansion of the Pacific Coast economy after the war. But such growth is ‘passive’ or ‘induced’ and, from first principles, can not account for the entire increase or explain its fundamental cause.

The second effect, based on the accelerator principle, recognizes that for some activities the size of local demand depends on the change (rather than the level) of local population and income. The construction sector and building-materials industries fall into this category. The vigorous growth of building activity explains another large part of the region’s post-war recovery. But this mechanism can not alone account for why the higher level of economic activity was sustainable. As the discussion of the investment accelerator in any standard macro text points out, the process has self-generating cycles. Once growth begins to slow, sectors characterized by an accelerator relationship will begin to contract, further slowing the economy. To explain the appearance of a permanently high level of economic activity in the region requires something more.

The third type of “home market effect”—the “threshold” effect recently highlighted in the New Economic Geography literature—is one possibility. The idea here is that production technologies for some goods involve fixed costs or other forms of increasing-returns-to-scale that make local production unprofitable if the local market is too small. As the market grows, it becomes economical to establish a larger number of plants producing a wider range of goods in the region. In this case, local production will increase more than one-for-one with an increase in the size of the local market. Much of the increase in western manufacturing outside of the “war industries” appears to fit into this category.

Multiple Equilibria?

The third type effect of “home market effect” is especially intriguing in light the prediction in the New Economic Geography literature that a region might possess more than one equilibrium level of economic activity consistent with the same “fundamentals”. Paul Krugman’s work has emphasized three factors-- increasing returns to scale (with the accompanying conditions of imperfect competition), labor mobility, and transportation costs -- are key for such “home market effects” to matter significantly. The case of manufacturing on the Pacific Coast in the mid-20th century matches the theoretical requirements well.34

In addition, accounts of the West's growth written as the region developed--the key works here are by Gordon and Niklason--stress the role of “home market effects” in the growth process. Gordon called the inadequate size of the western market "the most important factor that has hampered the growth of manufacturing” in the region. Because of the small market, western firms could not produce "on a sufficiently large scale” to offset the competitive advantages of eastern producing centers. Niklason's account of the long-run growth process is particular apt:

The volume of output necessary to take full advantage of the saving incident to large scale production depends upon the product, and the differences between various products in this respect are great. This factor alone precludes the immediate development of certain industries common to older, more populous regions...However, as population increases and creates larger markets, opportunity is given to establish new industries until eventually industrial maturity is attained....

These accounts also recognized the reverse flow from local production to local market size, which made the process self-reinforcing. Indeed, a reading of the region's business press yields the impression that the process was self-generating. In particular, many writers in the 1940s argued the temporary boom during World War II set “the West on its Way.”35

Did the World War II shock shift the Pacific Coast economy from a “low-level” equilibrium to a “high-level” equilibrium? Were the “home market effects” that strong?

To address these questions, this section explores in greater detail the long-run relationship between income and the value of manufacturing production. As part of a larger project on the economic development of the region, I have constructed a new panel data set on manufacturing activity in the United States and California for the period since 1849. The comprehensive data on four-digit industries were drawn from the Census of Manufacturing and assembled into consistent time series. (A list of the variables used in the analysis is provided in Table 7.) Unfortunately the data refer only to California and not the Pacific Coast as a whole. Given the state’s great importance in the region and its dominant role in the expansion during World War II, examining the California experience promises to shed considerable light on the development process more generally.

To assess the role of “home market effects,” I will predict the level on manufacturing value added in California using the level (or national share) of personal income earned in the state as a measure of the size of the home market. This analysis adopts the following conceptual approach: California manufacturing value added is modeled as proportional to national manufacturing value added,

\[ \text{CalVA}_i = \alpha_i \text{USVA}_i, \]

where the proportion, \( \alpha_i \), depends on relative demand, \( \delta(D_i) \), and supply, \( \sigma(S_i) \). D is a set of demand shifters, S supply shifters. That is,

\[ \text{CalVA}_i = \delta(D_i)\sigma(S_i)\text{USVA}_i. \]


Relative supply is modeled as a function of establishment scale, human capital requirements, relative wages over time, freight rates over time, and the industry’s 2-digit category. Relative demand is modeled as a function of the California income relative to national income (call $\theta_t = \text{CalY}_t / \text{USY}_t$) and, in some formulations, whether the industry exports.

A sample formulation would have $\theta_t$ raised to a power $\eta$ as in:

\[
\text{CalVA}_{it} = \delta(\theta_t) \sigma(Z_{it}) \text{USVA}_{it} = \theta_t^\eta \sigma(Z_{it}) \text{USVA}_{it}
\]

(or in logs)

\[
\log(\text{CalVA}_{it}) = \eta \log(\theta_t) + \log(\sigma(Z_{it})) + \log(\text{USVA}_{it})
\]

In the models run in the paper, the coefficient on $\log(\text{USVA}_{it})$ is not constrained to equal unity, reflecting the possibility that USVA enters in the supply shifters as well.

Following in the spirit of the Davis/Weinstein interpretation of Krugman’s work, the test of the “home market effect” hypothesis has two forms:

- $\eta > 0$  “home markets” matter at least weakly, (e.g. transport costs > 0).
- $\eta > 1$  “home markets effects” lead to a greater than one-for-one increase in production in line with the New Economic Geography models.\(^{37}\)

Table 8 presents the results of the Tobit regressions run on the pooled cross-section/time series over the 1880-1963 period. Equation 1 predicts the (log of) value added of each industry in California based on the (log of) industry’s national value added, establishment scale, and wages per wage earner, and time-series variables reflecting the general relative wage in California, an index of real regional freight rate, and California personal income and national personal income.\(^{38}\) A set of consistent and largely sensible

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\(^{37}\) See the fascinating series of studies by Donald Davis and David Weinstein, looking for “home market effects” in OECD and Japanese data; these are available at the Davis’s Harvard Economics web site.

\(^{38}\) One potential difficulty that must give pause is the endogeneity of industrial production and the size of the home market/ regional income. Indeed, the feedback from production to the market size is at the heart of the cumulative causation story. Here is where the micro-data help (in addition, to providing standard errors on the magnitude of the effects and a far number of degrees of freedom to test alternative explanations.) The typical 4-digit industry was very small compared with the total size of the California economy. For example, in 1939, the value added of the median California industry was $577,099, a little over one-tenth of one percent of the total personal income of $5.3 billion.
results emerges from the analysis. Industries with large establishment sizes nationally (as captured by lusrvest) had lower levels of output in the state, confirming the impression that the region’s limited market constrained industrial activity in sector characterized by increasing-returns-to-scale. Industries with low wages per worker (reflected in lusrwrgw) were also less common in the state.

Among the time series variables, the relative wage variable has a significant negative effect whereas the freight rates variable proved insignificant. The coefficient on California income has a large positive effect, but that on national income has a large(r) negative effect, which is troubling. Is this due to strong backwash effects? It seems more likely to be the result of the substantial collinearity that exists between state and national incomes. In line with the conceptual approach outlined above, the model may be run using income shares. The standard likelihood ratio test approves of this formulation (but it is interesting that the use of manufacturing output shares, that is constraining the coefficient of lusrva to be unity, is rejected.)

Equation 2 reports the results of the income share regression. The coefficient of California’s income share (as reflected by lcalusy) becomes about 1.44, which implies that a ten-percent increase in the size of the region’s market increases its industrial output by about 14 percent. This seems large, but it is not wholly implausible given that the elasticity of national manufacturing output with respect to income was about 1.27 in the sample. What remains implausible is that the effect is constant over all market sizes. Equation 3 addresses this problem by adding (orthogonalized) higher order terms in the market size variable. Likelihood ratio tests approve of including terms up to the third order. These results suggest an S-shaped and somewhat more damped “home market effect.” The exact impact of a change in the market size depends on what the market share is.

An key problem in the interpretation in these regressions is the issue of omitted variable biases. To control for the possibility that short-run supply shocks (strikes, earthquakes) might be attributed to the California market share, I have included individual year dummies in the model successively. In no case were the effects statistically significant nor were the basic results altered. Inclusion of a time trend also proved inconsequential.
There remains the possibility that the measured “home market effects” are picking up omitted long-run supply shifts. Indeed, the new economic geography literature has its own supply-side candidate—labor market pooling effects which can also lead to a positive feedback relationship. One way to begin to address this issue is to examine a model in which the export and non-export industries are treated separately. The “home market” and “plant scale” effects are presumably less important for the export industries. If the “home market” effect remains strong, it lends support to the argument that the model is really capturing supply-side instead of demand-side forces.

Equation 4 runs the regression with separate coefficients for the leading export activities, defined to comprise canning, petroleum refining, shipbuilding, and aircraft. The regression includes a new set of variables created by multiplying the existing variables times an one/zero dummy reflecting whether or not the industry falls in the export category. Essentially, these industries are allowed separate slope terms. While the estimates are not highly precise, the separate slope terms wipe out most of the establishment size and “home market” effects for the export industries. An increase in the region’s market size by one percent (using 1939 as a base) reduces output in the export industries by 0.6 percent. The absence of a “home market effect” for exports paradoxically supports the “home market” hypothesis overall— it’s not working where it shouldn’t.

What do these results imply about the possibility of multiple equilibria and the impact of WWII spending? To explore these issues, consider the toy model of the California economy. Let it be made up of three parts: a resource-base or export sector which produces a given output, B, independent of the size of the home market; a service sector where production grows proportionately with the home market, S=sY, and the manufacturing sector characterized by the non-linear production-income relationship.

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39 Inter-regional trade data are scanty but the available information indicates that canning and petroleum accounted for the vast majority of California manufacturing exports. Including aircraft and shipbuilding, these industries account for about 19.5 of California manufacturing value added in 1939.

40 The cubic series is quite well-behaved within the sample, but it would be problematic to extrapolate it far out of sample because no bounds have been imposed. The underlying series on the market/income share is quite flat until 1900s and then “takes off”; the stabilization of the income share begins in the late 1950s and early 1960, at the end of the period under consideration.
estimated above, \( M(Y) \). Ignoring the distinction between income and output, aggregate income will equal:

\[
(*) \quad Y = B + sY + M(Y) = \frac{(B + M(Y))}{1 - s}.
\]

Obviously, there may be multiple equilibria in \( Y \) supported by the same base, \( B \), if the non-linear equation (*) has more than one root. This will depend on the strength of the non-linear production-income relationship embodied in \( M(Y) \) relative to the size of \( B \). Even if there are multiple equilibria, they may not be very different if the roots are close.

Let us use this model to consider the state of California on the eve of World War Two. To be concrete, assume the primary sector (farming, agricultural services, and mining) is the base. Over the 1938-40 period, it made up about 10.5 percent of earnings in California whereas the state’s manufacturing sector accounted for about 16.1 percent of earnings. We will treat the remaining 73.4 percent of earnings as the service sector.\(^{41}\)

From the regression analysis, we know that holding all other variables (including national income) constant, the \( M(Y) \) relationship in 1939 has roughly the following form in the cubic specification:

<table>
<thead>
<tr>
<th>Percentage Increase in California:</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>9.4</td>
<td>17.0</td>
<td>22.8</td>
<td>26.8</td>
<td>29.0</td>
<td>29.4</td>
</tr>
<tr>
<td>Value Added</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A data point of special interest what would happen if income increased by 21 percent—the percentage change in California’s income share over the 1939-47 period. The regression equations indicate that a 21 percent increase in California home market would have resulted in a 27.3 percent increase under the cubic specification. In the model sketched above, would such increases in income created a sufficiently large
market (in the absence in a change in the base) to support itself? Simple calculations suggest not; the effects are powerful, but not quite enough. An increase in manufacturing value added of 27.3 percent combined with no change in the base would have increased California income by only about 16.6 percent (=\((0.105+1.273*0.161)/0.266\)-1).

But the results suggest that an increase in 1939 income by 11 percent would have been self-sustaining. An 11 percent increase would have increased manufacturing output by 18.5 percent, which in turn would have been sufficient to support the initial increase in income. This implies that roughly one-half of the increase in the region’s income share over the war might be due to a transition between “low-level” and “high-level” equilibria. Even if the “home market effects” have been overestimated here, the slope of the output-income relationship (*) appears quite steep in the relevant range. This implies a small change in the base, for example due to the shift in military spending from its low pre-war values to its somewhat higher post-war values, could have had a large effect on the level of aggregate activity. Obviously this is just a toy model, but these results offer surprisingly strong support for the rather speculative predictions of the new Economic Geography literature and call for further research.

Concluding remarks

This paper has argued that the experience of the Pacific Coast economy after World War II is consistent with the existence of strong “home market effects.” The econometric analysis of the long-run relationship between local income and manufacturing production suggests that these effects were not constant across all market sizes. Rather, they first increased and then diminished in strength. This has two interesting historical implications.

First, the “home market effects” appear strongest not in the immediate post-war period, but in the inter-war years. During the 1920s, the Pacific Coast, and especially California, enjoyed a period of vigorous economic growth, which was cut short by the

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41 If the definition of the base is enlarged to include federal government earnings (the extractive sector plus), the share of total income becomes 15.7 percent in 1939. The service share becomes 68.2 percent.
Great Depression. Many aspects of the region’s post-war experience—its population growth, the establishment of branch plants by national manufacturing firms, the building boom, and the expansion of the service sector—were also present in the 1920s. It remains an open question whether World War II shocked the Pacific Coast to a level of economic activity that was otherwise unattainable or merely sped the transition to the inevitable long-run equilibrium. I would argue that the continuity/discontinuity debate over the impact of World War II in the West should shift to consider this broader issue, which requires giving greater attention to the region’s secular development and less to the “four short years” of the war.

Second, the “home market effects” became far weaker as the region matured. If regional leaders used the late-1940s experience as a guide and downplayed the risk of becoming dependence on military spending in the Cold War period, they were drawing a mistaken historical lesson. When the cutbacks came in the early-1990s, the region’s economy appears to have suffered much more than after the larger declines of military spending in 1945-48. There was no great ‘unfilled’ home market waiting in the wings to absorb the displaced aerospace workers and to propel continued growth. You are only young once.

Making this change would tend to reduce further the possibility of multiple equilibria.