

## **Automobile Manufacturer Returns During World War II: From Cars to Armaments and Back**

**Fred R. Kaen**

Professor of Finance

Whittemore School of Business and Economics

Co Director: International Private Enterprise Center

University of New Hampshire

USA

### **Abstract**

*On January 3, 1942, Leon Henderson, head of the World War II Supplies Priority and Allocations Board, announced that all production of passenger cars and trucks for civilian purposes was to cease on January 15. The conversion was controversial. Many of the progressives in Roosevelt's circle and administration were skeptical of plans to have the private sector and "big business" in charge of war production and many in Congress viewed private business control of war production as a way for earning profits at the expense of labor and society at large. I examine these allegations using the stock prices of automotive companies during the World War II years. I find that investors in automobile companies did earn excess returns during the War years but not before and after the War. Furthermore, the major beneficiaries on the conversion were the small single line firms, not the giants.*

**Key words:** World War II, auto industry conversion, defense contracting, wartime stock returns

**JEL Classifications:** G10, N42, N22

*"I don't want to see a single war millionaire created in the United States as a result of the war disaster."*

President Roosevelt – May 21, 1940

*"The story of production for war would not be complete unless it dealt with industrial conversion, which, in large part, centers around the story of the conversion of our automotive industry..."*

Donald Nelson, Head of the War Productions Board

### **1. Introduction**

On January 3, 1942, Leon Henderson, who Roosevelt had placed in charge of the World War II Supplies Priority and Allocations Board (SPAB), announced that all production of passenger cars and trucks for civilian purposes was to cease on January 15. Henceforth, the automobile companies would dedicate their plants to manufacturing war materiel. From then until V-J Day, American automakers would produce 50 percent of the aircraft engines, 35 percent of aircraft propellers, 47 percent of the machine guns, 87 percent of aerial bombs, 80 percent of the tanks and 50 percent of the engines for the naval craft in addition to 100 percent of Army vehicles and many of the B-24 bombers (Herman, 2012). Total prime defense contracts awarded to the eight passenger car companies totaled \$27.1 billion or 15.5 percent of the total contracts awarded. The dollar amounts and companies are listed in Table 1.

The conversion was controversial. Many of the progressives in Roosevelt's circle and administration were skeptical of plans to have the private sector and "big business" in charge of war production. These included Vice President Henry Wallace, First Lady Eleanor Roosevelt, Harry Hopkins, the president's chief advisor, and especially Harold Ickes, the Secretary of Interior.

Herman describes these individuals and their supporters as “hoping war might offer a chance to complete the New Deal agenda.....and transform all sectors of American society into a single vast cooperative enterprise (p.75).” Furthermore, Ickes, as well as many in Congress and the public at large, viewed private control of war production as a way to earn profits at the expense of labor and society at large.

A counter view was expressed by Roosevelt’s Secretary of War, Henry L. Stimson. He wrote in his diary in 1940 that: “ If you are going to try to go to war, or prepare for war in a capitalist country, you have to let business make money out of the process or business won’t work.” Stimson’s view eventually prevailed and, at the urging of Roosevelt, Congress passed legislation that would motivate firms to accept defense contracts. Roosevelt prepared the public for this decision in a May 26, 1940 “fireside chat” after the fall of France. In it he said:

*“I know that private business cannot be expected to make all of the capital investment required for the expansions of plants and factories....It would be unfair to expect industrial corporations or their investors to do this, when there is a chance that a change in international affairs may stop or curtail future orders in a year or two hence.”*

He then announced that the government stood ready to advance the necessary money for the enlargement of factories and that “the details of all of this are now being worked out in Washington.”

Following this “chat”, Congress passed the National Defense Expediting Act. This Act permitted the government to make advance payments of up to 30 percent of contract prices. It also gave the Secretary of War the authority to construct and operate industrial plants that would be wholly or partially owned by the government. Eventually, the government would construct and lease \$11.185 billion of facilities and give the private operator of the plant the option to buy the facility at war’s end. The automobile companies received \$1.635 billion of this aid or 14.6 percent of the total.

Subsequently, at a press conference on July 10, 1940, Roosevelt called for a change in depreciation schedules, the elimination of Vinson Trammell Act profit limits and the imposition of an excess profits tax. On October 8, 1940, Congress responded to the press conference with the Second Revenue Act of 1940. This Act suspended the profit limits on aircraft and ship builders and permitted all companies to depreciate defense investments over five years or less instead of existing twenty years. An excess profits tax was also included (and increased in 1941, 1942, 1943) in order to prevent war profiteering and comply with Roosevelt’s desire for legislation for “prevention of profiteering and the equalization of the burdens of possible war” as contained in his request for increases in defense spending in 1938 (Brandes, 1997).

The shortening of depreciation schedules was especially important to the defense contractors because it negated some of the effects of the excess profits tax. By shortening the depreciation schedules the after tax cash flows of the companies were effectively increased which was important because it is the after tax cash flows that investors use to value company stock, not after tax net income. Harry Truman understood this and denounced these accelerated depreciation schedules as a form of “legal profiteering” (Brandes, p.262).

These Acts and subsequent legislation established the procurement conditions facing the automobile companies for the duration of the War. The Acts guaranteed profits through the use of cost plus contracts and financed the necessary manufacturing facilities either directly through the Defense Corporation Act or through substantial cash advances. Although a hefty excise profits tax was applied to the profits of the companies, this tax was negated to some degree by the reduction in depreciation schedules from twenty years to five years that effectively increased the after tax cash flows of the companies.

However, while the private firms remained in charge of manufacturing war materiel, they did operate under the direction of two government agencies. The first of these was the Office of Production Management (OPM) set up in 1941 and headed by William Knudsen, the president of General Motors. The second, which replaced the OPM in 1942, was the War Productions Board (WPB). The head of the WPB was Donald Nelson, the president of Sears Roebuck. It was Donald Nelson who, in recounting of his years at the WPB, noted that the Second Revenue Act was the most important factor in getting companies to accept defense contracts (Nelson, 1946).

Both Knudsen and Nelson were “dollar a year” men – they left their firms to serve in Washington for a dollar a year. But, the “dollar a year men” were also controversial. Opponents charged the men would favor sending business to their legacy firms – especially GM - and do so on advantageous terms.

Whether these arrangements for letting and overseeing defense contracts resulted in “excessive” profits for the contractors remains controversial. Higgs (1993) opines that “although no comprehensive study of contractor profits exists, no one has ever denied that the profits were substantial (p. 191).” And, Smith (1991), the author of *The Army and Economic Mobilization* volume in the Army’s history of World War II, writes that “... it is patent that World War II was highly profitable for American industry despite the existence of both [post War] renegotiation [of contracts] and taxes (p.396).”

In this paper I evaluate the critics’ concerns about placing control of war production in the hands of the private sector and their charges of potential war profiteering by examining the accounting and common stock returns of the automobile companies during the World War II years. I also examine how major political and military events affected the companies’ market values to gain additional insights about how investors thought the war contracts and outcome of the War would affect the profitability of these firms. By using the automobile companies I can evaluate not only their profitability during the War but also how it compared to their pre and post War profits and investor returns when they did not receive defense contracts – in effect a natural experiment with respect to converting from a purely “civilian” company to a “purely” defense contractor and back again.

My findings are firm specific as well as industry wide. Based solely on accounting measures of profitability, I find that the “smaller” single line companies earned higher profits during the War years than before the War. However, the after tax profitability for the two big multiple car line companies – GM and Chrysler – was less actually less when they were purely defense contractors than before the War when they were producing vehicles for the civilian market.

With respect to financial market returns, the equity returns for all seven companies during the War were greater than in the pre War years with the single line companies generating substantially greater returns than either GM or Chrysler and all companies turning in greater returns than the market index. However, on a relative basis, the single line firms had negative returns for the pre War years while Chrysler and GM had positive returns. These return comparisons suggest that the single line companies benefited more from the conversion to pure defense contractors than did GM and Chrysler.

After conversion and as the war progressed, the stock prices of the auto companies displayed no abnormal returns to the major 1942 and 1943 military events. But, this pattern changed on D-Day. Every company had significantly positive abnormal returns for D-Day, for the run up to V-E Day and the run up to V-J Day. Most likely investors believed that with the end of hostilities, passenger car production would resume and the “pent-up” demand for cars would enable the firms to become more profitable.

## ***2. The Companies and the Historical Periods***

My companies are the seven publicly traded passenger car companies in 1941: Chrysler Corporation, General Motors, Nash-Kelvinator, Packard Motor Car Company, Studebaker and Willys-Overland. Ford Motor Company was not a publicly held corporation until 1956.

I divide the “World War II” era into three major periods. The first runs from the March, 1938 German annexation of Austria (the *Anschluss*) through the December 7, 1941 Japanese attack on Pearl Harbor. This period is usually described as the U.S. defense buildup period (Fesler, 1947). It includes the 1938 Munich Agreement that set the stage for the German takeover of Czechoslovakia, the German invasion of Poland on September 1, 1939 that marks the official beginning of World War II, the invasion of Norway and Denmark and the Fall of France in 1940. I call this period the Run Up to War period.

My second period runs from Pearl Harbor through the surrender of Japan in August 1945 (V-J Day). These are years when the U.S. was actively engaged in hostilities and the automobile companies converted to pure defense contractors.

My final period covers the post war reconversion years from the August, 1945 Japanese surrender to the outbreak of the Korean War on June 25, 1950. Automobile companies resumed production of passenger cars in 1945 and sales in 1950 rose to 6,600,00 units compared to 3,746,00 units in 1941.

### 3. Research Procedure

I use three approaches for evaluating the profitability and returns for the auto companies. My first approach examines the firm's performance using financial accounting data.

My second approach uses daily stock returns to calculate holding period returns and Jensen's alphas for the three holding periods. My return data are daily returns from the CRSP tapes. The holding period returns are expressed in terms of an index calculated as follows: The value of the index is set to 1.0000 at the beginning of each period. I then calculate what the compound value of \$1.00 invested at the beginning of each period would be on every day during that period. For example, \$1.00 invested in Packard on December 8, 1941 would be worth \$3.7028 on August 14, 1945. My index for this period, then, would go from 1.0000 to 3.7028. In terms of percentage changes, I would report a return of 270.28 percent. I then compare these holding period returns to the holding period returns for the CRSP value weighted index (VwCrsp) and for the other companies.

I calculate Jensen's alpha to assess whether investors earned "excess" returns during the holding periods. Jensen's alpha is the intercept term in a regression of the excess return on the portfolio against the excess return on the CRSP value weighed market index (VwCrsp). The regression takes the form of:

$$R_{p,t} - RF_t = a + b_p(VwCrsp - RF)_t + e_t \quad (1.0)$$

where:

$a$  = Jensen's alpha,

$R_{p,t}$  = daily return on company or portfolio  $p$ ,

$RF_t$  = daily risk free interest rate; and,

$b_p$  = company or portfolio beta against the  $VwCrsp$ .

A significantly positive alpha means the stock or portfolio provided a return in excess of its beta risk required rate of return. A negative alpha means the return was less than its beta risk required rate of return.

My third approach is to evaluate the reaction of the individual company returns to major war related political and military events by calculating abnormal returns (AR) around the event dates. I measure the abnormal returns using a market model estimation process and the CRSP value weighted index (VwCrsp). The abnormal returns, (AR), are calculated as:

$$AR_{i,t} = r_{i,t} - E(VwCrsp_{i,t}) \quad (2.0)$$

$$\text{where: } E(r_{i,t}) = \alpha_i + \beta_i \times VwCrsp_{M,t} \quad (3.0)$$

$E(r_{i,t})$  is the expected return on the portfolio and the market model parameters  $\alpha$  and  $\beta$  are estimated over days  $t - 240$  to  $t - 30$  using an OLS model. The individual day abnormal returns,  $AR_t$ , are also used to calculate cumulative abnormal returns (CARs) for selected event windows.

### 4. A Financial Statement Perspective

Tables 2 through 4 contain selected balance sheet and income statement data for the six companies as well as selected financial ratios. I focus on comparisons between the War years, the run up to War years and the post War years.

The ratios in Table 2 are the ratios of the company's yearly sales to their 1941 sales. I use 1941 as the base year because most of the 1941 sales were still civilian vehicles. With a few exceptions (Chrysler and Nash in 1942), total sales during the War years (1942-1945) were generally greater than in 1941. Furthermore, the largest ratios are for the single line companies - Hudson, Nash (except 1942), Packard, Studebaker and Willys. These smaller companies experienced a relatively greater increase in sales than GM and Chrysler. A possible explanation for Nash-Kelvinator in 1942 is that it ceased producing appliances as well as cars. But, overall, the single line companies, on a relative basis, saw their sales increase relative to the multiple line firms.

Relative differences between the single and multiple line firms also exist for the accounting profitability measures reported in Tables 3 and 4. The profit margins for the single line companies were either higher or the same (Studebaker) during the War years than before the War with three of the single line companies – Willys, Nash and Hudson - being negative prior to 1942. In contrast, the profit margins for Chrysler and GM for the War years were less than for the pre War years.

The equity returns (ROEs) are similar to the profit margins. The average War year ROEs (net income after tax to common shareholders' equity) are greater than the pre War years for all of the single line companies. But, they are less for Chrysler and GM. Still, despite this decline, Chrysler's and GM's profitability remained greater than the other firms (except Willys) for the conversion period. But, did these ROEs translate into higher and/or "excess" returns for the shareholders of these firms?

### **5. Stock Returns**

The stock returns for the individual companies are contained in Table 5. In general, the returns reflect the underlying profitability of the companies as measured by the profit margins and ROEs during the pre-War and War years.

The return on the VwCrsp during the run up to war years was 2.69 percent. The returns for GM and Chrysler were, respectively, 17.64 percent and 11.27 percent. However, the returns for the other five companies were negative. For Hudson, -30.00 percent; Packard, -54.83 percent; Nash, -62.16 percent; Studebaker, -36.17 percent; and Willys, -35.00 percent. In other words, prior to the awarding of defense contracts, the five single line companies were doing poorly and had yet to recover from the 1937 recession. Despite these negative returns, though, the Jensen alphas for the little five for these years are not significantly different from zero as reported in Table 6.

However, a different return pattern emerges for the War years. During these years, the return on the VwCrsp was 98.47 percent. Once again, GM and Chrysler returns were greater; 157.46 percent for Chrysler and 128.88 percent for GM. But, the returns for single line firms were not only greater than the VwCrsp, they were also greater than those for Chrysler and GM. The numbers are 954.15 percent for Hudson, 522.56 percent for Nash, 270.28 percent for Packard, 569.78 percent for Studebaker and 1271.42 percent for Willys. For these firms, the defense contracts were the difference between underperforming the two majors before the War and outperforming them during the War.

The difference in the run up to War years and the War years themselves is also evident in the Jensen alphas for the companies. The alphas are significantly positive at the 0.008 level or less for every company. These alphas tell a story similar to the profit margins and ROEs for these years. Investors, during these years, earned excess risk adjusted returns on the stocks of these firms, including Chrysler and GM.

The return pattern changes again during the post War years when it becomes very similar to the pre War years. The return on the VwCrsp from V-J Day to the June 1950 outbreak of the Korean War is 68.44 percent. Both GM and Chrysler have higher returns of 101.14 percent and 93.43 percent. All the "little five" have returns less than GM and Chrysler and four of the five have returns less than the overall market – the exception being Studebaker with a return of 76.64 percent. Furthermore, three of the five – Hudson, Packard and Willys - have negative returns.

These financial market returns reflect the profitability of the companies as measured by profit margins and ROEs. The two single line companies with positive stock returns are Nash and Studebaker and these firms have ROEs similar to the two majors – all have ROEs of around 21 percent. The ROEs for the other three – Hudson, Packard and Willys – are less than 14 percent with Willy's being 4.86 percent. These are also the three firms with negative post War market returns.

Jensen's alphas reflect these returns relative to the VwCrsp. The alphas for GM and Chrysler are positive but not significantly different from zero. The alphas for the little five are negative with Willys being significantly negative at the 0.02 level and Hudson at the 0.11 level. Retrospectively, the major beneficiaries of the defense contracts were the smaller auto manufacturers, not the giants. The single line firms had higher profits during the War than before the War and their investors earned higher returns than the two majors.

In contrast, the profitability of GM and Chrysler as measured by ROEs and investor returns was less during the war years when their total production was for the military than it was prior to Pearl Harbor and after V-J Day.

## **6. Automobile Manufacturer Stock Prices and the Fortunes of War**

My third way of evaluating how the War affected the financial fortunes of the automobile companies is to examine their share price reactions to major political and military events during the War. The events I have selected are generally regarded as historically significant during the run up to War years and the War years themselves. I examine the following events: Pearl Harbor, Leon Henderson's announcement of the end of passenger car production, the Battle of the Coral Sea, Midway, El Alamein, the invasion of Sicily, D-Day, the defeat of Germany (V-E Day) and the defeat of Japan (V-J Day).

### **6.1 Pearl Harbor and the end of passenger car production**

The Japanese attacked Pearl Harbor on Sunday, December 7, 1941. The next day the U.S. declared war on Japan and the industrial mobilization of business for the War began. The abnormal returns for the Japanese surprise attack are in Table 7. The overall market reacted negatively to the Japanese attack with the VwCrsp falling by over 7 percent on the two days following the attack. All of the auto company stocks fell as well. However, in the immediate aftermath, the single line companies posted negative CARs while Chrysler and General Motors recorded significantly positive CARs. One interpretation is that investors believed the two large companies would not suffer as much as the smaller firms – all of which have negative two day CARs. Willysstock, the company that would eventually benefit the most in relative terms, suffered the most in relative terms with a two day negative CAR of -17.62 percent.

However, by the end of the week only GM and Chrysler have CARs significantly different from zero and these had turned from positive to negative. Auto company stocks were behaving much like the market itself although an equally weighted portfolio of all seven companies did have a significantly negative six day CAR of -3.14%. So, one could infer that from an overall industry perspective, investors believed the automobile industry as a whole would not benefit more as a result of the impending mobilization of American industry than other industries and perhaps less. The announcement by Leon Henderson on January 3, 1942 that all passenger car production would cease on January 15 and the plants would undergo conversion to produce tanks, planes, jeeps and other military materiel apparently altered investor perceptions about the near term fortunes of the auto firms. The four day CARs (Table 8) around the announcement are positive for all firms as are the CARs for the week and month following the announcement. The industry portfolio CARs are positive for all windows and statistically significant at the 0.001 level for all but the announcement day itself. Based on the abnormal returns, investors did not think that the War and the forced conversion to military production would negatively affect the values of these firms relative to firms in other industries; instead they might actually be beneficiaries relative to other industries.

### **6.2 Victory at Sea and in North Africa: 1942**

The first major battles of the War for the U.S. were naval engagements where the U.S. Navy scored two major strategic victories. The first was the Battle of the Coral Sea from May 4 through May 8, 1942. Although this Battle was considered a tactical Allied defeat because of U.S. losses heavier than Japanese losses, it was considered a strategic victory because it prevented a Japanese invasion of Port Moresby and disabled Japanese vessels that would otherwise have been available for Midway. The outcome at Coral Sea had little effect on either the overall market or the auto companies. From May 4 through May 8, the return on the VwCrsp was 1.34%. The returns on the auto companies were mixed but no abnormal returns are associated with this Battle.

The Battle of Midway was fought shortly after Coral Sea from June 4 through June 7, 1942 and is widely regarded as the most important naval battle during the War. The battle, itself, was fought near the tiny U.S. mid-Pacific base at Midway atoll and represented the strategic high water mark of Japan's Pacific Ocean war. Prior to this action, Japan possessed general naval superiority over the United States and could usually choose where and when to attack. After Midway, the two opposing fleets were essentially equals, and the United States soon took the offensive. The Battle began on a Thursday (June 4) and ended on a Sunday (June 7). Until near the end the outcome was in doubt. Between Thursday June 4 and Tuesday, June 8, 1942, the overall market gained 3.28 percent. The automobile company returns were less than the markets but none had significantly negative CARs for the period.

The third important event in 1942 according to Fesler (p. 204) was October 1942 when the British launched the Battle of Egypt (El Alamein) and emerged victorious. The relevant dates for the El Alamein are Friday, October 23, 1942 through Wednesday, November 4, 1942. The return on the market over these days was 0.45 percent. Again, none of the automobile companies had significantly positive or negative CARs over these days. The outcome of the early battles had little effect on either the overall market or the automobile companies. Although the Allies prevailed, the outcome of the War itself was still uncertain so no one could predict when or how it would end and when or under what circumstances reconversion to passenger car production would occur. In the meantime, defense orders kept the firms busy and profitable.

### **6.3 The Turn Toward Victory and Reconversion**

By 1943, the tide of the War had turned. The siege of Leningrad ended in January, 1943. German troops surrendered at Stalingrad and the Germans were driven from Africa. In 1943 the Allies invaded Italy, Mussolini was overthrown and Italy joined the war against Germany. In the Pacific, U.S. forces captured Guadalcanal and continued their island-jumping campaign. Then, on D-Day - June 6, 1944- the Allies landed in Normandy. At home, war production peaked in September 1943 in response to the 1942 and 1943 victories as the Allies began planning for the end of the War. The invasion of Sicily took place on Friday, July 9, 1943. The Germans began their full scale withdrawal on August 11, 1943. The early days of the invasion are marked with negative CARs for the auto companies (except Hudson). However, for the entire campaign of July 9 through August 12, the CARs for the firms and the industry portfolio are not significantly different from zero (Table 9). So, from a perspective covering the entire engagement, the results are similar to the 1942 battles. This similarity continues with the invasion of Italy on September 3, 1943. No CARs are significantly different from zero for this military operation.

D-Day, however, is an entirely different story. All the auto companies have positive CARs following D-Day and six of the seven have statistically significant positive CARs as does the industry portfolio (Table 10). For the week of D-Day, the CARs are either significantly positive or not significantly different from zero. My interpretation is that investors sensed the War might finally be nearing an end and the companies could resume passenger car production. Given that no passenger cars had been produced since 1942, investors probably anticipated a seller's market for the vehicles and better than pre-War profits for the companies. This interpretation is supported by the CARs for V-E Day and V-J Day.

Selecting a date for the effective defeat of Germany is arbitrary. However, a reasonable choice for the beginning of the end is April 16, 1945 with the end being V-E Day on May 8, 1945. Daily and cumulative abnormal returns are reported for these days in Table 11. On April 16, 1945 the Allied air force announced that future operations over Germany would focus on cleanup and not strategic targets. This decision effectively ended the air war in Europe. Although the one day abnormal returns are significantly negative for Hudson and Nash, the industry portfolio abnormal return is essentially zero.

On April 18, 225,000 German troops surrendered in the Ruhr. For this date, the industry portfolio's abnormal return is a statistically significant 2.72 percent at the 0.001 level with four individual firms having statistically significant positive abnormal returns. For April 16 through V-E Day, the industry has a significantly positive CAR primarily driven by Chrysler, Nash, Willys and Hudson. General Motors and Packard stocks show no abnormal behavior.

These generally positive CARs for Victory in Europe are consistent with the D-Day CARs. Again, my interpretation is that investors thought the auto industry as a whole would benefit from the end of the War because of the pent up demand for passenger cars. As the war in Europe ended, attention turned to Japan. Following V-E Day, Truman, who became President after Roosevelt died in April, traveled to Potsdam to meet with Churchill and Stalin on July 16, 1945. At the conference Truman received word that an atom bomb was successfully detonated in New Mexico on that same day (July 16). On July 26, the U.S. released the Potsdam Declaration calling for the unconditional surrender of Japan and threatening "prompt and utter destruction" if Japan did not accept the terms. Japan refused and on August 6, 1945, the U.S. dropped the atom bomb on Hiroshima. On August 9, 1945, Nagasaki was bombed. On August 10 Japan offered to surrender conditionally but the offer was rejected. Then, on Sunday, August 12, Emperor Hirohito ordered the Japanese government to surrender unconditionally. The war ended on the afternoon of August 15 (Japan) and August 14 (U.S) – the difference is due to time zones - and the Allies celebrated V-J Day.

The days between the beginning of the Potsdam Conference and the surrender of Japan are marked by statistically positive CARs for the individual firms and for the industry portfolio (Table 12). For the three days around the release of the Potsdam Declaration, the portfolio has a 3.15 percent abnormal return. The five days around Hiroshima and Nagasaki the portfolio abnormal return 2.75 percent. For the days between Japan's conditional offer to surrender and V-J Day the portfolio abnormal return is 3.53 percent with the firms exhibiting significantly positive or zero CARs. From Potsdam to V-J Day the portfolio CAR is a 5.56 percent and is significant at the 0.001 level. The positive CARs continue to suggest that investors regarded the end of the War as good news for the auto industry. Conversion was not seen as a problem; instead it was an opportunity for the firms to earn profits and, based on the CARs, perhaps outperform the average firm as proxied by the market index.

## **7. Summary and Conclusions**

Public concerns about war profits and war profiteering by defense contractors were ever present during the World War II years. The concerns grew out of the charges leveled against defense contractors during and after World War I where they were labeled "merchants of death" and "War Hogs." So, when Roosevelt decided to leave the production of war materiel in the hands of private businesses, the question of how to prevent war profiteering by these firms quickly surfaced. Roosevelt's administration's solution to "war profiteering" was an excess profits tax. Whether the excess profits tax actually was successful in curbing war profits remains a controversial issue.

I investigate this question by focusing on the automobile companies that ceased production of passenger cars in 1942 so as to dedicate their entire facilities to producing war materiel and using market return measures as well as accounting measures of profitability. By using the automobile companies I can evaluate their profitability not only during the War but also compare it to their pre and post War when they did not receive defense contracts. My findings are firm specific as well as industry wide. Based solely on after tax accounting measures of profitability, I find that the "smaller" single line companies earned higher profits during the War years than before the War. However, the after tax profitability for the two big multiple car line companies – GM and Chrysler – was actually less during the time they were purely defense contractors than before the War when they produced vehicles for the civilian market.

With respect to financial market returns, the equity returns for all seven companies during the War were greater than in the pre War years with the single line companies generating substantially greater returns than either GM or Chrysler and all companies turning in greater returns than the market index. This "outperformance" of the market is confirmed by the significantly positive Jensen alphas for all the firms during these years – including GM and Chrysler despite their accounting returns being less during the War years.

A comparison of the relative financial market returns for the pre and War years leads to a conclusion similar to that of the accounting measures. All the single line firms had negative returns for the pre War years; Chrysler and GM had positive returns. The comparisons suggest that the single line smaller companies benefited more from the conversion to pure defense contractors than GM and Chrysler. That the conversion to military production would not result in lower returns for the shareholders – as evidenced by the Jensen alphas – is borne out by the abnormal returns around the January 3, 1942 announcement that production of passenger cars would cease for the duration of the War. The cumulative abnormal returns for every company were positive and usually statistically significant. For the industry as a whole, the three day cumulative abnormal return was 9.73 percent.

As the war progressed, the stock prices of the auto companies displayed no abnormal returns to most of the major military events during 1942 and 1943. However, this pattern changed on D-Day. All the companies have significantly positive abnormal returns for D-Day, for the run up to V-E Day and the run up to V-J Day. Most likely investors believed that with the end of hostilities passenger car production would resume and the "pent-up" demand for cars would enable the firms to be profitable. With hindsight, this was the case for all the firms except Willys with respect to the accounting profitability measures. However, this profitability was short lived for some of the single firm companies and is reflected in their financial market returns which are negative for the post War years. Retrospectively, all the auto firms benefited from the conversion to military production and, in the case of some of the single line companies, may have prolonged their life as independent firms.

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**Table 1: Publicly traded automotive companies: Selected 1941 data**

Company	1941 Assets (Millions of \$)	1941 Sales (Millions of \$)	Defense contracts* (Millions of \$)	Defense contracts as percent of 1941 sales
Chrysler	255.3	888.4	3,394.8	382.1%
GM	1,747.3	2,436.8	13,812.7	566.8%
Hudson	31.4	66.8	290.0	434.1%
Nash	61.6	122.0	1,162.2	952.6%
Packard	96.8	115.3	1,783.3	1546.7%
Studebaker	49.9	115.7	1,143.8	988.6%
Willys	18.9	21.8	522.2	2395.4%

\**Economic Concentration and World War II* (1946)

**Table 2: Yearly sales relative to 1941 sales**

Year	Chrysler	GM	Hudson	Nash	Packard	Studebaker	Willys
1950	2.466	3.091	3.999	3.500	1.177	4.123	4.953
1949	2.347	2.339	3.885	2.984	1.101	4.089	6.536
1948	1.765	1.929	4.111	2.482	0.980	3.316	8.050
1947	1.534	1.566	2.387	2.051	1.072	2.316	6.341
1946	0.979	0.805	1.806	0.996	0.939	1.224	2.766
1945	1.120	1.284	1.074	1.500	0.803	1.840	8.233
1944	1.236	1.749	1.326	2.249	0.715	3.593	9.754
1943	0.998	1.558	2.319	1.515	0.752	3.148	7.702
1942	0.702	0.924	1.596	0.672	0.844	1.914	5.017
1941	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1940	0.838	0.737	0.907	0.602	1.011	0.727	0.669
1939	0.619	0.565	0.868	0.594	1.030	0.706	0.426
1938	0.465	0.438	0.581	0.443	1.131	0.378	0.509
1937	0.867	0.659	1.115	0.660	1.115	0.611	1.390

**Table 3: Net profit margin (Net income after taxes/Sales)**

Year	Chrysler	GM	Hudson	Nash	Packard	Studebaker	Willys
1950	0.058	0.111	0.045	0.068	0.030	0.047	0.010
1949	0.063	0.115	0.039	0.072	0.036	0.058	0.020
1948	0.057	0.094	0.048	0.066	0.065	0.050	0.037
1947	0.049	0.075	0.036	0.072	0.028	0.034	0.019
1946	0.031	0.045	0.020	0.021	0.045	0.007	0.004
1945	0.038	0.060	0.009	0.014	0.005	0.015	0.015
1944	0.023	0.040	0.019	0.011	0.009	0.010	0.016
1943	0.026	0.039	0.011	0.022	0.014	0.008	0.018
1942	0.025	0.073	0.020	0.047	0.021	0.009	0.012
1941	0.045	0.083	0.056	0.038	0.018	0.021	0.037
1940	0.051	0.109	-0.025	0.020	0.009	0.025	-0.060
1939	0.067	0.133	-0.023	-0.022	0.007	0.036	-0.201
1938	0.045	0.096	-0.120	-0.141	-0.027	-0.040	-0.124
1937	0.066	0.122	0.009	0.045	0.028	0.011	0.009
Mean: Post war	0.0516	0.088	0.0376	0.0598	0.0408	0.0392	0.018
Mean: War years	0.0280	0.0530	0.0148	0.0235	0.0123	0.0105	0.0153
Mean: Pre war	0.0548	0.1086	-0.0206	-0.0120	0.0070	0.0106	-0.0678

**Table 4: Return on equity (After tax net income to common shareholders/Common shareholders' equity)**

Year	Chrysler	GM	Hudson	Nash	Packard	Studebaker	Willys
1950	0.249	0.349	0.167	0.252	0.066	0.225	0.018
1949	0.280	0.320	0.156	0.266	0.106	0.323	0.050
1948	0.232	0.252	0.230	0.255	0.209	0.301	0.120
1947	0.207	0.200	0.125	0.282	0.062	0.190	0.050
1946	0.095	0.070	0.058	0.052	0.078	0.023	0.005
1945	0.136	0.151	0.020	0.051	0.020	0.080	0.096
1944	0.098	0.132	0.050	0.082	0.070	0.104	0.120
1943	0.102	0.118	0.046	0.080	0.087	0.084	0.156
1942	0.076	0.158	0.064	0.077	0.092	0.071	0.110
1941	0.205	0.190	0.144	0.095	0.045	0.093	0.090
1940	0.200	0.195	-0.068	0.034	0.017	0.087	-0.118
1939	0.215	0.192	-0.055	-0.037	0.012	0.132	-0.225
1938	0.120	0.112	-0.169	-0.175	-0.037	-0.093	-0.135
1937	0.249	0.220	0.167	0.069	0.066	0.039	0.018
Mean: Post war	0.2126	0.2382	0.1472	0.2214	0.1042	0.2124	0.0486
Mean: War year	0.1030	0.1398	0.0450	0.0725	0.0673	0.0848	0.1205
Mean: Pre war	0.1978	0.1818	0.0038	-0.0028	0.0206	0.0516	-0.0740

**Table 5: Percentage equity holding period returns for World War II years**

Company	<i>Anschluss</i> to Pearl Harbor, %	Pearl Harbor to V-J Day, %	V-J Day to June 25, 1950 Korean War outbreak, %
Chrysler	11.27	157.46	93.43
GM	17.64	128.88	101.14
Hudson	-30.00	954.15	-21.19
Nash	-62.16	522.56	54.50
Packard	-54.83	270.28	-33.36
Studebaker	-36.17	569.78	76.64
Willys	-35.00	1271.42	-73.43
Auto portfolio (Equally weighted)			6.18
VwCrsp	2.69	98.47	68.44

**Table 6: Jensen's alphas and company VwCrsp betas for World War II historical periods**

*Jensen's alpha is the intercept term of a regression of company daily excess returns against daily excess returns on the value weighted CRSP. The excess returns on the companies are calculated by subtracting the nominal risk free interest rate from the actual returns. The nominal risk free rate for these years is the U.S. Treasury three-month interest rate that was converted to a daily rate. A positive alpha means the portfolio generated returns in excess of a beta-risk adjusted required rate of return. A negative alpha means the returns were not sufficient to compensate for beta risk. The portfolio betas are from the Jensen alpha regressions.*

Company	<i>Anschluss</i> to Pearl Harbor, %		Pearl Harbor to V-J Day, %		V-J Day to Korean War outbreak, %	
	alpha	beta	alpha	beta	alpha	beta
Chrysler	0.0000	1.536	0.0013***	1.334	0.0000	1.389
GM	0.0001	1.428	0.0008***	1.200	0.0000	1.237
Hudson	-0.0004	1.705	0.0061***	2.350	-0.0008	2.183
Nash	-0.0004	1.606	0.0041***	1.920	-0.0002	1.832
Packard	-0.0001	1.458	0.0027**	1.523	-0.0005	1.342
Studebaker	-0.0001	2.207	0.0063***	2.599	-0.0002	2.175
Willys	0.0011	1.605	0.0082***	2.856	-0.0015*	2.330
Auto portfolio (Equally weighted)	0.0000	1.649	0.0042***	1.969	-0.0004#	1.784

- # Significant at the 0.10 level
- \* Significant at the 0.05 level
- \*\* Significant at the 0.01 level
- \*\*\* Significant at the 0.001 level

**Table 7: Pearl Harbor Cumulative abnormal returns (CARs)**

The market index is the CRSP value weighted index (VwCrsp). The estimation period is from -240 to -30 prior to the event date. The event date is Sunday, December 7, 1941.

Company	CAR 0 December 8, 1941	CAR 0,1 December 8-9, 1941	CAR 0,+6 December 8-13, 1941
Chrysler	0.0185	0.0491**	-0.0505*
General Motors	0.0189*	0.0642***	-0.0257#
Hudson	-0.0756*	-0.1289**	-0.1295
Nash	-0.0426#	-0.0687*	-0.0826
Packard	0.0020	-0.0083	0.0376
Studebaker	-0.0170	-0.0112	-0.0123
Willys	-0.0752#	-0.1762**	0.0431
Equally weighted auto portfolio	-0.0244	-0.0400	-0.0314*
Return on VwCrsp	-0.0410	-0.0755	-0.0644

# Significant at the 0.10 level

\* Significant at the 0.05 level

\*\* Significant at the 0.01 level

\*\*\* Significant at the 0.001 level

**Table 8: CARs for the announcement that passenger car production will end on January 3, 1942**

The market index is the CRSP value weighted index (VwCrsp). The estimation period is from -240 to -30 prior to the event date. The event date is Saturday, January 3, 1942.

Company	CAR 0 January 3, 1942	CAR -1, +2 January 2-6, 1942	CAR -1, +6 January 2-10, 1942	CAR -1, +30 January 2-February 5, 1942
Chrysler	-0.0078	0.0151	0.0288	0.0725#
General Motors	-0.0130*	0.0488***	0.0259	0.0866*
Hudson	0.0311	0.1299*	0.1441#	0.1370
Nash	-0.0293	0.0493	0.0515	0.2396#
Packard	-0.0139	0.1390**	0.2305**	0.1532
Studebaker	0.0332#	0.1336***	0.1412*	0.2536*
Willys	-0.0139	0.1060	0.0722	0.0706
Equally weighted auto portfolio	0.0006	0.0973***	0.1111***	0.1598***
Return on VwCrsp	0.0118	0.0355	-0.0099	0.0000

# Significant at the 0.10 level

\* Significant at the 0.05 level

\*\* Significant at the 0.01 level

\*\*\* Significant at the 0.001 level

**Table 9: CARs for the invasion of Sicily: July 9, 1943**

The market index is the CRSP value weighted index (VwCrsp). The estimation period is from -240 to -30 prior to the event date. The event date is Friday, July 9, 1943.

Company	CAR 0,1 July 9 – July 10	CAR 0,3 July 9 - 12	CAR 0.30 July 9 – August 12
Chrysler	-0.0094	-0.0122	-0.0040
General Motors	-0.0109#	-0.0174#	-0.0165
Hudson	0.0238	0.0277	0.1043
Nash	-0.0220	-0.0276	0.0132
Packard	-0.0088	-0.0302	-0.0112
Studebaker	-0.0348*	-0.0483*	0.0457
Willys	-0.0355	-0.0482	-0.0763
Equally weighted auto portfolio	-0.0140*	-0.0223**	0.0024#
Return on VwCrsp	0.0047	0.0099	-0.0439

# Significant at the 0.10 level

\* Significant at the 0.05 level

\*\* Significant at the 0.01 level

\*\*\* Significant at the 0.001 level

**Table 10: D Day CARs: June 6, 1944**

The market index is the CRSP value weighted index (VwCrsp). The estimation period is from -240 to -30 prior to the event date. The event date is Tuesday, June 6, 1944.

Company	CAR 0,1 June 6 – 7, 1944	CAR 0,5 June 6 – 12, 1944	CAR 0,6 June 6 – 13, 1944
Chrysler	0.0062	0.0191	0.0156
General Motors	0.0095#	0.0240*	0.0186#
Hudson	0.0322	0.0420	-0.0091
Nash	0.0394**	0.0577**	0.0590**
Packard	0.1041***	0.1752***	0.2091***
Studebaker	0.0592**	0.0933**	0.0675**
Willys	0.0850***	0.1927***	0.1425**
Equally weighted auto portfolio	0.0479***	0.0863***	0.0719***
Return on VwCrsp	0.0030	0.0006	0.0147

# Significant at the 0.10 level

\* Significant at the 0.05 level

\*\* Significant at the 0.01 level

\*\*\* Significant at the 0.001 level

**Table 11: Victory in Europe CARs: April 16, 1945 – May 9, 1945 (V-E Day)**

The market index is the CRSP value weighted index (VwCrsp). The estimation period is from -240 to -30 prior to the event date. The event date is Monday, April 16, 1945 when the U.S. Air Force halted strategic bombing.

Company	CAR 0 April 16 Air Force stops strategic bombing	CAR 2 April 18 225,000 Germans surrender in the Ruhr	CAR 0,3 April 16 – April 19	CAR 0,14 April 16 – May 1	CAR 0,21 April 16 – May 9 (V-E Day)
Chrysler	0.0002	-0.0021	-0.0093	0.0435*	0.0501#
General Motors	0.0044	0.0006	-0.0029	0.0011	-0.0062
Hudson	-0.0522*	0.0482*	-0.0215	0.0320	0.1302
Nash	-0.0255*	0.0717***	-0.0286*	0.1066**	0.1042**
Packard	0.0236	-0.0151	-0.0012	-0.0211	-0.0230
Studebaker	0.0003	0.0279*	-0.0083	0.0307	0.0006
Willys	-0.0083	0.0593**	0.0245	0.1317#	0.1229
Equally weighted auto portfolio	-0.0082	0.0272***	0.0030	0.0463**	0.0541**
Return on VwCrsp	0.0179	0.0081	0.0040	0.0188	0.0223

- # Significant at the 0.10 level  
 \* Significant at the 0.05 level  
 \*\* Significant at the 0.01 level  
 \*\*\* Significant at the 0.001 level

**Table 12: CARs for Victory in Japan**

The market index is the CRSP value weighted index (VwCrsp). The estimation period is from -240 to -30 prior to the event date. The event date is Thursday, July 16, 1945 when the Potsdam Declaration was announced.

Hiroshima was bombed on August 6, 1945. Japan offered to surrender conditionally on August 10, 1945. Japan surrendered unconditionally on August 15, 1945 (V-J Day)

Company	CAR 0,2 July 26 -30 Potsdam declaration	CAR 16,20 August 7 – August 13 Atom bombs	CAR 19,22 August 10 – August 15 (V-J Day)	0,24 July 26 – August 17
Chrysler	0.0199#	0.0252#	0.0327**	0.0841**
General Motors	0.0201*	-0.0043	0.0080	0.0363#
Hudson	0.0332	0.0729#	0.0345	0.0235
Nash	0.0767***	0.0382	0.0226	0.0669
Packard	0.1387***	-0.0112	-0.0074	0.0513
Studebaker	0.0788**	0.0745*	0.0122	0.1046#
Willys	0.0471#	-0.0028	-0.0391	0.0223
Equally weighted auto portfolio	0.0315***	0.0275*	0.0353***	0.0556***
Return on VwCrsp	0.0122	0.0104	-0.0022	0.0224

- # Significant at the 0.10 level  
 \* Significant at the 0.05 level  
 \*\* Significant at the 0.01 level  
 \*\*\* Significant at the 0.001 level