



# An Overview of the Cash For Clunkers Program and an Assessment of its Success



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## Abstract

The United States automobile industry was one of the first sectors to be hit by the economic downturn of 2008-09 and it was also one of the hardest hit industries. At the same time there has been an intensive debate regarding the fuel efficiency of United States automobile fleet given concerns surrounding dependence on foreign oil and also the possible impacts of climate change. The Car Allowance Rebate System (CARS), more commonly known as *Cash for Clunkers* (CFC), was launched by the federal government in July 2009 and lasted through the end of August. This project uses data from a variety of sources and reviews the existing research literature to give an overview and assess the impact of the CFC program. This project explains the rules and guidelines as well as the program's goals. We then examine how the program affected automobile sales in the US, WI and the Chippewa Valley. Lastly, we review the environmental economics literature and comment on the cost-effectiveness of the program in reducing carbon emissions to address climate change.

## Overview

### Goals

The CFC program was intended to provide economic incentives to purchase new, more fuel-efficient vehicles while trading in a less fuel-efficient vehicles. The program was also intended to provide an economic stimulus by boosting auto sales while also putting cleaner, more fuel-efficient vehicles on roadways.

### Guidelines

All trade-in vehicles must:

- Be less than 25 years old.
- Have a city/highway fuel economy of no more than 18mpg.
- Be in drivable condition.
- Be continuously insured and registered to the same owner for one year preceding trade-in.
- Be scrapped upon trade-in.

All new vehicles must:

- Have a suggested retail price of no more than \$45,000.
- Have a city/highway fuel economy of at least 22mpg.

### Auto Sales History

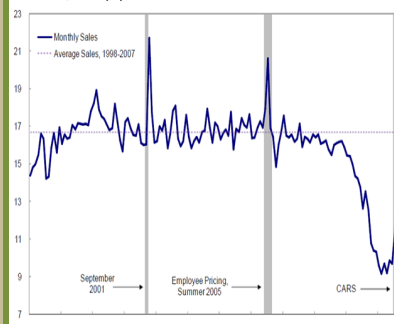
Figure 1 shows the decline of the auto industry beginning with a slight downturn in 2007 followed by a dramatic drop in sales through 2008 and into 2009. The subsequent rise in sales beginning in mid 2009 coincides closely with the implementation of the CFC program.

We next provide a more detailed look at this increase in auto sales by examining trends across individual domestic and foreign auto manufacturers.

Figure 1

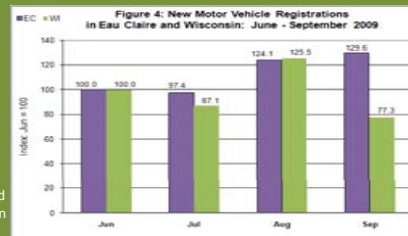
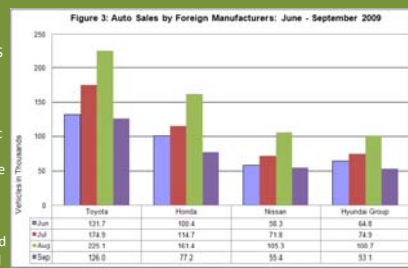
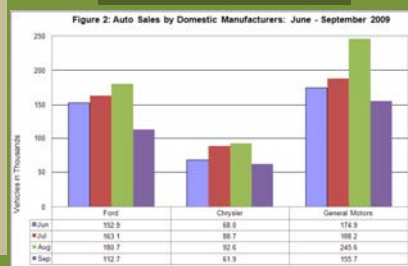
## U.S. Light Motor Vehicle Sales, 1998-2009

Millions of units, seasonally adjusted annual rate



Source: Department of Commerce (Bureau of Economic Analysis)

## Economic Impact Analysis



### Auto Sales

Figures 2 and 3 show that all domestic and foreign auto manufacturers saw increases in US sales from June-July and July-August followed by a marked decline from August-September.

On average, sales among domestic manufacturers increased 15.1% over the program period, while the average increase in sales for foreign manufacturers was higher at 29.5%. After the program ended, sales for both domestic and foreign manufacturers plummeted by 35.8% and 47.7% respectively.

Chrysler had the largest increase in sales among domestic auto manufacturers from June-July (30.4%), while GM gained the most sales from July-August (30.5%). Similarly, Toyota gained the most sales from June-July (32.8%), while Nissan's sales increased 46.6% from July-August. After the program ended, Ford and Honda had the sharpest declines in sales from August-September at 37.6% and 52.2%, respectively.

We now change our focus and take a brief look at WI state and local data for new motor vehicle registrations, a proxy for auto sales. Figure 4 shows this data for the Eau Claire MSA (EC) and the state of WI as a whole indexed to base June 2010 = 100. Both WI (2.2%) and EC (12.9%) had fewer registrations in July compared to June followed by significant increases in August (27.4% and 44.1% respectively). New motor vehicle registrations in EC remained at this higher level for September, while WI registrations dropped sharply (38%).

Overall, automobile sales jumped in response to the CFC program for both US and foreign automakers, but this boost in sales was only temporary. The pattern of increasing and decreasing sales appears to have been slightly different in EC and WI than for the nation as a whole.

### Employment and GDP

Next we examine the effect of the CFC program on employment and Gross Domestic Product (GDP). According to the Washington Post, Honda announced plans to increase production at its US plants as did the Detroit three (GM, Ford, Chrysler), especially in high efficiency vehicles. The President's Council of Economic Advisors estimated that the CFC program created about 70,000 additional job years (an additional job for a full year) in Q3 and Q4 of 2009. Overall, the Economic Policy Institute estimated that increased consumer spending from the CFC program accounted for up to 40% of GDP growth in the 3rd quarter of 2009 as a result of the multiplier effect.

There are, however, some caveats that must be considered to understand the full economic effect of the CFC program.

- Some cars sold during the program period would have been purchased anyway
- Some purchases that would have occurred prior to the program were delayed.
- There is also a "payback" period of lower than normal sales after the program ends.

## Environmental Impact Analysis

We next explain the estimated cost effectiveness of the CFC program with respect to its environmental goals of increasing fuel efficiency and reducing carbon emissions. This requires assessing both the costs and benefits associated with the program's implementation.

A significant issue with evaluating the cost effectiveness of environmental policies is putting a value on the environment. In the context of the CFC program, this means estimating the value of reduced carbon emissions, which would be the benefit of the program. Alternatively, the cost was the amount of money the government spent to subsidize the trade-in of clunkers.

### The Value of Carbon Reduction

The value of reduced carbon emissions can be thought of as the benefit of lessening the effects of climate change, which in practice is extremely complex and at best very difficult to accurately measure.

- Moderate estimates range from \$237 to \$365 per ton (we use \$300/ton as an average).
- This suggests that it would be inefficient to pay more than this for carbon reduction.

The net reduction in carbon emissions as a result of the program arises from increased fuel efficiency.

- Average increase in fuel efficiency between clunkers and new cars = 9.2 mpg (from 15.8 to 25.0 mpg).
- Net reduction in gasoline use = 280 gallons per car (assuming 12,000 miles driven per year).
- One gallon of gasoline burned creates an estimated 20 pounds of carbon emissions.
- Net reduction of carbon per car, per year = 2.8 tons (20 x 280 = 5,600 lbs).
- Clunkers had an estimated early retirement of 3-4 years.

Therefore, each clunker traded in would have removed 8.4 - 11.2 tons of carbon (3 x 2.8 or 4 x 2.8). Given the estimated value of \$300/ton of carbon eliminated, the benefit of the program = \$2,520 - \$3,360 per vehicle (\$300 x 8.4 = \$2,520 or \$300 x 11.2 = \$3,360 respectively).

### The Program Cost

- Average clunker payout = \$4,200
- This exceeds the value of carbon reduction by \$840 to \$1,680.
- \$4,200 > \$2,520 (\$1,680) or \$4,200 > \$3,360 (\$840)
- 700,000 vehicles were replaced by this program
- Estimated loss = \$588 Million - \$1.2 Billion

According to these calculations the CFC program was an inefficient method of reducing carbon emissions.

### Other Variables to Consider

- "Clunkers" that were traded in may have had a longer life than the 3-4 year estimate used here.
  - This would increase the amount of carbon emissions eliminated by the program.
- The value of reducing carbon as it pertains to climate change could be substantially higher than \$300/ton.
  - The increased fuel efficiency of the replacement vehicles could lead new-car owners to drive more.
    - This would create more carbon emissions despite the better mileage.
- The auto industry is likely to design even more fuel efficient cars in the near future.
  - This would mean the replacement vehicles were less fuel efficient than they otherwise could have been.

## Conclusion & References

As an economic stimulus, the *Cash for Clunkers* program was viewed by many to be a great success. It spurred auto sales in the US by both foreign and domestic manufacturers. It also created numerous jobs in the auto industry as well as other sectors through the multiplier effect. However, there is a strong counter-feeling that these effects were largely temporary and perhaps even stolen from the future.

The larger uncertainty is whether or not the *Cash for Clunkers* program was a cost effective method of reducing carbon emissions to address global climate change. There is no doubt that many "clunker" vehicles were taken off the road and replaced with newer more efficient automobiles. However, the economics literature estimates that the program's cost could have far exceeded the benefit to the environment. It is important to note that these estimates were based on many arguable assumptions

In sum, the US government spent three billion dollars of tax-payer money to fund the *Cash for Clunkers* program, but we may never reach a consensus on whether the program was a true success.

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