Constructing the Carbon Coalition

Thomas Oatley

December 2019

Revised and expanded October 2, 2020

The carbon coalition emerged in the United States in the middle of the twentieth century and stood securely at the center of the American political system until the mid-1970s. In broad terms, the carbon coalition was a tripartite distributive bargain between labor, business, and agriculture that solved the two conflicts that had dominated American politics during the late 19th and first half of the 20th centuries. The first conflict pit agriculture against manufacturing. This conflict emerged as urban-rural inequality increased in the late 19th century due to the sharp decline of commodity prices. The intensity of this distributive conflict waxed and waned between 1880 and 1950, moving to the center of the American political agenda in some periods, as during the eras of monetary populism of the 1890s and the farm movement of the 1920s, and taking a back seat in periods of rising demand for American commodity exports, as during the early twentieth century through the end of World War I. The second distributive conflict pit labor against capital in a struggle over how to distribute the income generated by capital-intensive manufacturing.

These distributive conflicts were so intractable, and consequently defined American politics for so long, because it was not possible to solve one conflict without aggravating the other. The central constraint arose from the failure to realize significant productivity gains in either agriculture or manufacturing until after 1920 (Irwin 2003; Shackleton 2013; Wright 1990). The result was a three-way zero-sum distributive struggle over the fixed (or very slowly-growing) income per capita generated by the emerging heavy industries. This conflict was further sharpened by the dramatic fall in commodity process that resulted from connecting the grain belt to urban centers by the railroad and by an increase in the number of people engaged in agricultural activity. Indeed, commodity prices fell sharply between 1880 and 1910 and then collapsed again after the War while the number of farmers doubled between 1860 and 1880 and then increased by an additional 30 percent between 1880 and 1910 (Lebergott 1966, 122–23). Stabilizing farm incomes in the face of these trends thus required a significant transfer of purchasing power from urban consumers to rural producers. Yet, measures that transferred income to farmers would reduce incomes in manufacturing and sharpen the conflict between workers and management. A direct income transfer to the farmers would require additional taxes on income generated in manufacturing, which would have to be paid by labor or management. And any effort to boost commodity prices would increase food costs in urban centers and reduce the real wage. Labor was reluctant to bear these costs, especially as wages had failed to rise much during the 1920s. And, if labor proved successful in its effort to capture a larger share of the

income generated by the large-scale capital intensive manufacturing industries, then there would be a lower return to capital and less income to transfer to the farm sector.

A settlement that satisfied all three groups became possible only as the transition to a petroleum-based energy regime after 1920 provided the needed boost to productivity in agriculture and enabled the motor vehicle industry to acquire its dominant position in the American economy. Although oil had played a role in the American economy from the late 19th century, it gained status as the predominant energy source only with the development of oil fields in Oklahoma, Texas, and California and the discovery of the massive East Texas oil field in October 1930. As these fields came online, American oil production rose sharply, from 300 million barrels per year in 1916 to 2.3 billion in 1950.[1] As a result, oil began to power American industry and agriculture and played an increasingly important role in peoples' daily lives. As Brian Black summarizes, "oil empowered the middle class and helped the United States attain the world's greatest standard of living."[2]

It wasn't oil itself, however, but rather the application of oil to agriculture and transportation that produced the income necessary to resolve the distributive conflict that had for so long roiled American politics. In agriculture, the development and diffusion of tractors sharply boosted labor productivity (Olmstead and Rhode 2001, 665–66). Ford began mass production of the first affordable and functional ICE tractor in 1917. By 1944, tractors were substituting for 1.7 billion hours of human labor per year on American farms, the equivalent of 850,000 workers (Olmstead and Rhode 2001, 665–66). The number of workers each farm needed to support thus fell by almost ten percent between the two World Wars and by close to one-quarter by 1960 (ibid). This obviously reduced the scale of the transfer from the urban sector needed to support the standard of living of farm households.

But it was the motor vehicle industry more than any other that transformed oil into the economic surplus that underwrote the carbon coalition. The central importance of the motor vehicle industry is evident in the very term we use to characterize this economic era: Fordism. Fordism in broad terms was the application of energy to manufacturing in order to increase productivity; "a revolution in energy which generalized the industrial use of electricity and made possible the construction of high capacity motors which enormously increased the power available to industry (Aglietta (1979) cited in Huber 2013, 178). In the American economy, the amount of inanimate (machine) horsepower deployed in manufacturing activity

[1]US oil production rose from 301 million barrels in 1916 to 2.25 billion barrels in 1951 (Hamilton 2012, 62).

[2] Black, Brian C. 2012. "Oil for Living: Petroleum and American Conspicuous Consumption." *Journal of American History* 99(1): 43. These figures omit the economic and employment consequences of motor vehicle consumption. Oil industry; road construction and the interstate highway project; the reorganization of American society—suburbanization—which necessitated the construction of new communities and housing developments.

increased from 40 million in 1920 to 242 million by 1955.[3] The diffusion of these "highly efficient electric motors…brought much higher labor productivities" (Smil 1994, 194; Shackleton 2013, 8; Schurr and Netschert 1960, 189). And while we often focus on technology, humans developed these technologies specifically to exploit the energy contained in fossil fuels. As Alfred Chandler Jr (1980, 49) wrote, "Nearly all the fundamental technological advances of the past two centuries have provided ways to use fossil fuels more efficiently in the processes of production and distribution."

Fordism, in narrower terms, was the industrial use of energy to mass produce motor vehicles. And it was Fordism in this narrower sense that created the income that was needed to ease the distributive conflicts that had dominated American politics for close to half a century. Indeed, it is hard to overstate the impact of motor vehicle production on the American economy. Consider the economic impact of the automobile industry alone, ignoring for the moment the upstream suppliers as well as other motor vehicles such as farm implements and aircraft. Annual production of automobiles increased 5.6 times in the long half century following World War I, peaking at an average of 8.8 million vehicles per year in the run up to the 1973 oil shock. Together, the major auto makers directly employed about 900,000 workers (approximately 1.25 percent of the civilian labor force) in the quarter century that followed the end of World War II. The auto dealer network employed another million people, while "an additional 1.8 million [workers] derived their livelihood from the auto aftermarket and the need for maintenance and repair."[4] Almost 4 percent of the civilian labor force was thus directly employed in making and selling cars.

The indirect impact of the auto industry on the American economy was far greater. The industry consumed one fifth of the nation's steel output, "one out of every fourteen tons of copper, more than two out of every five tons of lead, more than one out of every four tons of zinc, one pound in seven of nickel, one-half the reclaimed rubber, almost three-fourths of the upholstery, leather, and substantial proportions of total national output of glass, machine tools, general industrial equipment, and forgings."[5] When we take these contributions into account, the auto industry directly and indirectly supported 1 of every 7 jobs in America's postwar economy.[6] We might also then include the workers that produced farm implements and

[3]Series S1-14 Total Horsepower of All Prime Movers: 1849 – 1955 https://www2.census.gov/library/publications/1960/compendia/hist_stats_colonial-1957/hist_stats_colonial-1957-chS.pdf?.

[4] United States. Dept. of Transportation. 1981. *The U.S. Automobile Industry: Report to the President from the Secretary of Transportation*. Washington D.C.

[5] Lanzillotti, Robert F. 1971. "The Automobile Industry" in *The Structure of American Industry*, ed. by Walter Adams (New York: The MacMillan Company), 256. US Department of Transportation (1981).

[6]These gains were realized through the combination of technological innovation, large capital investments, and easy access to abundant natural resources. The extraction of iron ore from the Masabi Range in Minnesota after 1892 sharply reduced input costs for iron and steel production which in turn reduced input costs in downstream industries. "Iron ore comprised nearly 60% of the materials costs of producing blast-furnace products (mainly pig iron) in 1890. A 50% decline in the price of iron ore, if

aircraft as well as the construction crews that built the interstate highway system.[7] In addition, much of the extraction, refining, and distribution petroleum was organized around the need to supply the auto industry, and provide gasoline. Oil thus enabled a growing share of the workforce to shift from low-productivity agriculture to the high productivity and motor vehicle centered manufacturing economy, thereby creating the conditions for a tripartite agreement that made all parties better off.

The distributive settlement developed gradually through a set of politically independent but functionally interdependent agreements. A resolution to the rural-urban conflict came first. The Roosevelt administration stabilized farm incomes with the Agricultural Adjustment Acts of 1933 and 1938, and the Truman administration brought the arrangement into the postwar era with the Agricultural Act of 1949. Through these Acts the US government established commodity price floors and created a fiscal system (the Commodity Credit Corporation) as well as the administrative procedures required to make these price floors effective. These measures were paid for, in part, by legislation that increased tax rates on corporate profits.

Resolution of labor-capital conflict proceeded more slowly. The Ford Motor Company moved more quickly than the other major firms to provide somewhat more generous wage and benefit packages to its workers, but it remained resistant to unionization and union-management bargaining. The Roosevelt administration's creation of the Wagner Act and the National Labor Relations Board and the Fair Labor Standards Act constituted first steps, but it fell principally upon collective bargaining between unions and individual American corporations after World War II to reach a comprehensive distributive bargain. The most significant such bargain came in 1950 when the United Auto Workers (UAW) and GM signed the so-called "Treaty of Detroit". Under the terms of this agreement, the UAW sacrificed its right to annual strikes in exchange for fairly significant wage and non-wage concessions from GM, concessions that included pensions and healthcare. These elements of the Treaty of Detroit developed into a distinctively American set of private welfare state benefits in which unionized workers gained rather generous health care and pension plans. The privatization of the welfare state would create problems in the future, but at the time worked to the benefit of labor without business facing strong intrusions by the American state. The UAW and its management partners in other motor vehicle firms extended the core logic of Treaty of Detroit to

---

fully passed through to the value of products, would imply a 30% reduction in the materials costs of producing pig iron, or a 22% reduction in its price (assuming a constant markup). Pig iron, in turn, comprised 50% of the materials costs (and 32% of the value) of steel works and rolling mills, including various products such as steel rails and wire" (Irwin 2003, 369).

[7] The US dedicated 1.74 percent of GDP annually to the construction of roads between 1956 and 1965, the high point of the interstate highway construction project (see Congressional Budget Office, 2018. "Public Spending on Transportation and Water Infrastructure, 1956 to 2017." https://www.cbo.gov/publication/54539).

the rest of the industry. And the terms of the agreement then expanded out to the rest of American manufacturing. As one study concluded, "The outcome of the key bargain [in the auto industry]…set the pattern for all UAW negotiations—with automobile manufacturers, farm implement producers, aerospace equipment firms, and producers in other industries" (Budd 1992, 524).[8]

The Carbon Coalition thus organized broad societal support for a distributive settlement made possible by oil. Because the coalition was cross-sectoral, as well as cross-class, it bridged the gap between the rural and urban segments of the electorate by creating an overarching common interest in the carbon economy. Oil enabled agriculture to become just as industrial as manufacturing, and manufacturing provided the machines that allowed farmers to realize this vision. And indeed, the postwar years saw American agriculture become increasingly industrialized as a result. Second, the distributive outcome was viewed as legitimate and broadly equitable. The settlement was legitimate because the mechanisms that distributed income were perceived to be tied to production and productivity. In the motor vehicle industry, revenues were distributed by bargaining between unions and management within the confines of an individual firm. Much of the transfer from the urban sector to agriculture was heavily disguised as price floors and non-recourse loans supported by unobserved restrictions on international trade rather than as cash transfers from the government. The resulting distribution of income was viewed as relatively equitable across sectors and classes and achieved largely through private rather than public interventions. These distributive elements upon which the Carbon Coalition created a common interest in a political economy that produced a distributive outcome that most perceived to be equitable and a legitimate.

Finally, the impact of the automotive-centered economy rippled outward to the rest of America, transforming the structure of American society and thereby strengthening its dependence upon and support for the carbon economy. Car ownership increased five-fold between 1945 and 1975, encouraging a suburbanization of American life and increasing the number of people who drove to work and the average number of miles driven (Huber 2013, 180).[9] As the distance between home and workplace increased, the typical American drove more, with per capita miles driven increasing 3.3 times in the same period.

---

[8] "[F]irst, wages are primarily determined in bargains between unions and employers; second, wages are determined in wage rounds; third, wages in a group of heavy industries, which we call the key group, move virtually identically because of the economic, political and institutional interdependence among the companies and the unions in these industries. When these factors are incorporated into the statistical framework, wages in the key group are explained by the profit rates and the unemployment rates in the group. Wages in some other industries outside this group are largely determined by spillover effects of the key group wages and economic variables applicable to the industry; three industries defy explanation" (Eckstein and Wilson 1962, 408).

[9] Humber (2013, 179) "even in the 1930s, the majority of workers lived relatively close to work…As late as 1949, "the bulk of factory workers live close to work and beyond two or three miles the proportion of factory workers decreases.

Finally, the American public expected this economic structure to persist into the indefinite future. The Roper organization asked a sample of 1500 Americans the following question in the summer of 1961. "For each of the industries on that card, would you tell me whether you regard it as being a growth industry with a bright future, or a steady industry not apt to go up or down, or a declining industry that will probably slip further as time goes on?" The respondents believed by an over whelming amount that the auto industry (80%), the steel industry (77%), and oil (75%) were likely to make steady or growing contributions to the American economy. (Roper Commercial #126, Speculation, July 1961).

The carbon coalition transnationalized after World War II. It did so within as well as across societies. Within societies, the American policymakers sought to replicate the tripartite settlement achieved in the US by drawing on the surplus produced by an industrial sector organized largely around motor vehicle production. In societies with existing motor vehicle industries—or even with a recent past of motor vehicle production—such as Britain and Germany, the requisite settlement was readily achieved. Across societies, the carbon coalition was constructed through fostering trade. Countries in which the motor vehicle industry was too small to support domestic agriculture, or where agriculture was not yet sufficiently mechanized to release labor to industry, found that they could draw upon the surplus generated by carbon-intensive intensive motor vehicle industries in neighboring countries. Cross border transfers were achieved via foreign aid flows in cases and by institutionalized international mechanisms such as the Common Agricultural Policy in others. Moreover, because so few countries held oil reserves of any significant volume, the transnational coalition drew in the oil-rich middle eastern and gulf countries.

The international economic order supported and helped further develop this transnational carbon coalition. The international political economy prioritized liberalizing trade in motor vehicles and their components and encouraged foreign direct investment in capital intensive industries such as automobiles. This regime thereby encouraged and supported the global diffusion of a mass production model centered upon motor vehicles. At the same time, the rules supported higher incomes for the farm sector everywhere by excluding agricultural commodities from trade liberalization.

The median distance of industrial workers in Massachusetts was 2.2 miles. Between 1960 and 1990, the proportion of workers who drove to work increased from 64.4 to 86.5 percent.