Explaining Automobile Dependence in the United States: Financial and Industrial Concentration and Demand Management

Aaron Golub
golub.aaron@gmail.com

Assistant Professor
School of Planning and School of Sustainability
Arizona State University
Tempe, Arizona

Abstract

Automobile dependence in the United States results from one hundred years of industrial and urban development and public policy priorities. Several theories have been developed to understand this process. This paper revisits the theory emphasizing industrial organization and competition. The automobile industry's placement within the faster growing sectors of the economy early in the last century explains much of the favor and emphasis in planning and policy-making the automobile would enjoy. The various financial and industrial groups connected to and dependent upon the automobile are explored and the significance of these connections for influencing policy and development is postulated.

Introduction

Nothing defines urban passenger transportation in the United States more than the automobile. The dependence on automobiles for passenger travel is extreme. The number of vehicles has long surpassed the numbers of households, and the average car will be driven over 11,000 miles per year – over 30 miles per day (FTA, 1997). Gleaning information from the most recent *Commuting in America* report, around 90% of all households in the U.S. have at least one vehicle, and in a growing number of households, there are one or more vehicles for each adult (Pisarski, 2006). The share of trips to work in the U.S. by automobile hovers at around 88%, with over 75% of that as single occupant – and these rates continue to rise. The rates of using transit, bicycling and walking to work all continue to decline to just a few percent each. And these are for those trips typically more amenable to transit and carpooling; non-work trips are even more car-intensive. Over half of the population now lives in the suburbs, up from 23% in 1950, and only 30% live in traditional central cities. The exodus to the suburbs over the past 100 years has meant that more and more people live where there are no options for travel other than the automobile. On a typical major street in these suburban areas, any transit service which may exist likely operates on 20-minute headways, or worse. Land uses are segregated, highly dispersed, of very low density, are often surrounded by parking lots and typically unattractive and even unsafe places to walk. This built environment all but prohibits traveling by modes other than the automobile, thereby creating what is often termed "automobile dependence." Living in all but small sections of a handful of urban areas without a car substantially reduces opportunities for work, shopping, and recreation. The expense of owning and maintaining a car becomes like an entrance fee required to participate in the mainstream of metropolitan life (Cervero).

The United States was not always this way. It was an early innovator in public transit systems and had a healthy transit ridership until the 1920s (with a short-lived upsurge during the Second World War). The electric trolley was invented in the United States, and by 1910, most cities of any size had trolley

systems with the total trackage peaking at 45,000 miles (about 3 times the size of the interstate highway system) in 1918 (Sawers, 1984, p228). This paper will not enter into the debate over the advantages or disadvantages of automobile dependence or debate which - public transit or automobiles - is better. It will only seek to understand how such dependence came to be. Understanding the transition to automobile dependence has fascinated historians of urban development and technology for some time and is the subject of an existing and large body of academic literature, various popular folklore about industrial conspiracies, and even a federal anti-trust case.

This paper will revisit this debate and add a new perspective to previously developed lines of thought on the subject. It will propose a rubric for thinking about the move to automobile dependence, and gather several secondary sources to test this rubric. Using these existing references, this paper will try to see if the approach "holds water," and whether further work is warranted. The next section presents background about the theories of growth of automobile dependence in order to place this paper's argument in context.

Background: Theories on the Growth of Automobile Dependence

Thought concerning the growth of automobile dependence and the transportation planning process favorable to automobile travel has developed along six basic lines. These theories are not mutually exclusive and indeed at times overlap, inform or reinforce each other. The first involves the aesthetic movement towards automobiles and suburbanization: urban planners' perception that suburbs and the automobile were morally, environmentally and aesthetically superior to urban living. This is embodied in the work of Foster and others (Foster, 1981).

The next set of theories posit that the operating environment for transit became too onerous to compete with the automobile, which was being supported by an array of public policies which were not matched equally by policies supporting public transit systems. Various terms of operating franchises such as strict fare regulations were repressive to public transit and thus prevented the development of more

advanced public transportation systems and exacerbated the loss of ridership to the growing automobile. This theory is embodied in the work of Bianco and others (Bianco, 1999 and 1997).

A third line of thought places the impetus of development and advantage on the automobile technology itself which beat out public transit in hundreds of cities because it was technologically superior and was chosen by users in a free market of urban transportation choices. This theory emphasized consumer sovereignty in unfettered markets, emphasizing the performance characteristics of the automobile, and is put forth by Meyer and Gomez-Ibanez among others (Whitt and Yago, 1985, p. 38).

A fourth line of research showed how weaker urban rail-based industrial actors lost out to automobile-based actors in the arena of urban transportation planning and policy making: the industrial grouping based around the automobile was more powerful and more effective at steering public policy in favor of the automobile, while industrial groups around the electric streetcar were weaker, less organized and could not muster support outside of key transit markets where transit had natural advantages. These actors were many times seen to be backwards or associated with monopoly behaviors. The automobile-based actors used their power to build broad support for planning policies which would all but lock out any competition in the urban transportation arena for decades (indeed, only recently are more balanced approaches being applied). The series of work by Whitt and Yago develop this theory (Whitt and Yago, 1985, Whitt, 1982, Yago, 1984).

A fifth thread of “conspiracy theories” concern automobile manufacturers’ involvements with public transit holding companies in order to control them and stifle their growth, which are perhaps a less significant figment of the previous, forth, institutional theory (Snell, 1974). More specifics of this process are discussed later on, with additional information found in the appendix.

A sixth line of thought is more general and far-reaching, arguing that the bias towards automobiles reflected the push towards suburbanization on the part of large industrial groupings, and where the automobile and the automobile industry was important to this suburbanization process. This

work is the most “structural” in approach, emphasizing capital’s needs for expansion and for places to invest surpluses within the particular constraints of so-called “Monopoly Capitalism” (Baran and Sweezy, 1968). Automobiles are only a peripheral item here: a mechanism among many others in the process of resolving crises of accumulation on the part of monopoly capital. This line of thought coincides with the institutional work of Whitt, et al., but instead of the focusing on the needs and struggles of specific industries, it looks at the needs and struggles of all of capitalism. It is embodied in the work of Sawers (1984), Ashton (1984) and Baran and Sweezy (1968).

Proposed Hypothesis to Understand Automobile Dependence

This paper builds on the institutional view of Whitt and Yago but hypothesizes that the important historical process behind the growth towards automobile dependence was *not* a competitive one, as they argue. This paper builds on the structural view of the Sawers et al, but seeks to add details and explore the particular industries most tied to and responsible for adding force to the push for automobile dependence.

The theory explored here starts with the institutional view. A competitive process did occur for an initial and short period, before the coalition surrounding the production of the automobile grew so large as to become, for all practical purposes, the entire economy. After this transition, there was no competitive process, because no other outcome was inconceivable. The automobile industry, subordinate supplier industries (oil, steel, rubber, etc.), other consumer goods industries related through the suburbanization process, and the dozens of large banks, insurance companies, and other financial institutions became both interlocked and interdependent while growing so large as to, for any intent and purpose, *become* the economy. They no longer swam in the water – they were the water.

The hypothesis of this paper is that the automobile industry was swept up into broad changes happening to the whole economy while the urban transit industry was left behind. The economy was changing and consolidating and the automobile and its surrounding industries found themselves together at the crest of this wave, while the urban transit industry did not. What was good for GM became good for

the United States not because of competitive positioning or struggle, but because, as will be argued, the economy *was* GM, and GM *was* the economy. The theory then assumes that the formidable political power from such a coalition could proceed unhindered in promoting and adopting policies in favor of its needs.

In exploring this theory, this paper will focus on presenting evidence for these formidable connections across the economy which offers the automobile such favor in policy making. This paper will attempt to illustrate just how deep and far these connections reached, and why understanding the growth of automobile dependence as a competitive process underestimates the level of connection and consolidation the economy underwent during the period in question. The interest here is in those eras when the automobile took strides towards achieving a state of dominance in urban transportation. This period appears to begin during the decade of the 1920s and continued, with several interruptions, until the sixties. Evidence in five areas of connection and control will be gathered:

1. Direct Financial: Direct Ownership or Management
2. Indirect Financial: Industrial Networks
3. Direct Management: Interlocking Directorates
4. Political Organizations: The Policy Formation Process
5. Motivations for Policy Control: Demand Management

The paper will begin by looking at the growth of the economy and how the looming insurance and banking sectors became interconnected with automobile and automobile-related industries. Next, the connections between suburban growth and automobile dependence and industrial growth are explored. Connections via interlocking boards of directors then show how these large firms are connected beyond direct financial control. How large firms organize themselves and articulate policy needs and desires is the subject of the next section. The fifth section addresses the question of motives. While the organization required to provide the power to shape urban policy might exist, the questions remain: is there a clear motivation for these groups of industries to act on this power, and why would it lead to automobile

dependence? Finally, we conclude by discussing implications of the scale and breadth of these connections on demand management and the steering of public policy and investment priorities in favor of automobility, and compare this to the changes happening to the public transit industry during the same period.

1. Direct Financial Connections: The Automobile Economy

In this section, the specific composition of the automobile-centered economy will be illustrated, first, in terms of its subordination to sources of capital, and second, its links to other supporting industries such as oil and steel.

The Automobile Industry

By many measures, the automobile has been the single most important product of the U.S. economy over the past 80 years, and is, essentially, its center piece. Lee Iacocca, then executive vice president of Ford Motor Company, explained this clearly in a 1974 Senate hearing on the Clean Air Act:

> The manufacture of motor vehicles and its parts is the largest industry in America - first in sales, first in employment and first in payrolls. Automobile manufacturing and distribution and automotive transportation provide 15 million jobs - 28 percent of the private non-farm employment.
>
> Each car and truck manufactured and sold in the U.S. generates 1,200 dollars in taxes - nearly 35 percent of the average retail price. And these taxes provide nearly 5 percent of the total tax revenue of all units of government.
>
> That is why this bill is a threat to the entire American economy and to every person in America. (Taebel and Cornehls, 1977, p. 63)

The automobile and its directly related industries, including rubber and oil, now among the largest sectors in the U.S. economy, looked very different at the turn of the century, and arose to their present places of importance during the period between 1910 and 1925.

The automobile industry came to being between 1895 and 1900, during which approximately 3000 automobiles were built and sold. This early period was marked by turbulence and instability. Between 1900 and 1908 there were a total of 499 company starts with only 47 surviving (Denison, 1956).

Since most of the early manufacturers were merely assembling parts and components from other industries like carriages, motors, etc., the industry was characterized by low investments of capital and labor, and most production was done by small shops in fairly low volumes. Early sources of capital were from smaller banks, venture capitalists and other individuals from throughout the country, though the most significant were located in the mid west. Figure 2 shows the number of automakers operating in the industry over the period from 1895 to 1929. During this period as well, the major subcomponents of the automobile were still being developed, including body types and construction, materials, coatings, finishes, and overall manufacturing processes. By the end of this period, however, the structure of the industry was better defined as many of its major players had survived the early highly competitive environment.

Figure 1. The rise and fall of automobile firms during the first decades of the industry. [Denision]

While the early automobile manufacturers were able to supply most of their capital needs internally or from smaller local sources, the growing costs of larger, more complex and automated technology made it more and more dependent on larger established sources of capital. Alternatively, after many of the larger companies showed some periods of success and stability, large banks and capitalists became increasingly interested in the automobile and its auxiliary industries for investment purposes.

The first major move incorporating the growing automobile industry into the larger organization of capital was the 12.5 million dollar loan to rescue General Motors in 1910, ousting its leader, William Durant, and placing control of the operation into the hands of the lending New York bankers until 1915. Soon, most of the major automakers were coming to larger established sources of capital for their expansion needs. In 1916, even the elusive Henry Ford was on Wall Street borrowing 75 million from a group of banks centered on Chase National. The role financing had in this period of industrial expansion is summarized well in Trescott (1963, p. 266):

> A bank might become a sort of rallying point for a group of "Capitalists-at-large," through which they sought out new and promising fields of enterprise, new men, and ideas to back. The National City Bank of New York filled this role in the hey day of James Stillman and the "Standard oil crowd"; so did the various elements of J.P. Morgan's financial realm. In Pittsburgh, the Mellon Bank played a vital role in a remarkable variety of important industrial ventures.

As the industry grew, suppliers to the industry became industries unto themselves. During the 1920s, the oil, rubber, steel, paint and chemical, as well other growing durable goods and appliance industries were becoming important investments for a broad range of banks and sources of capital. The links between the automobile and sources of capital are not static, though some generalizations along with a few snapshots at different stages will be made to illustrate the relationships which existed.

The term "Monopoly" will be used loosely throughout this paper. While it is rarely referring to a situation of an exclusive provider for a market with concomitant monopolistic welfare losses, it used in a political sense. "Monopoly capitalism," is defined by Baran and Sweezy (1968) more technically as a regime of capitalist economies based on how the surplus of the economy is absorbed, as compared to other regimes of capitalism. For our purposes, the term is used to describe a situation where firms are so large, they enjoy certain shelters from competition, either through dominance of the market, suppliers, etc or through favor from governments. Of course, this is what the paper is trying to set out to prove, so using the term is really to reach the conclusion first. The problem is that the term is a most elegant way of describing the concentration and connectivity of the industry. In essence, the paper is setting out to confirm that Monopoly is the appropriate term for the industry.

Around the turn of the century, following the trend towards monopoly in many sectors of American capitalism, capital was increasingly concentrated into just a few significant camps: the Morgan, the Stillman-Rockefeller (later Chase Manhattan/National City), and the three much smaller Mellon, Chicago-centered, and Cleveland-centered groups (Kotz, 1978). Even these divisions are never very clear, seeing that they each have interconnecting directors, and lend, borrow or manage parts of each others' capital.

The Morgan group, whose capital came mainly from railroads, steel, and a virtual monopoly on managing English capital investments in railroads at the end of the 19th century, controlled many industries key to the automobile economy. Morgan played the most important role in forming the General Electric company out of the Edison G.E. company and the Thomson-Houston company in 1892 (Kotz, 1978, p. 31). U.S. Steel was another of Morgan's creations. The Morgan group consisted of J. P. Morgan and Co, First National of New York, Bankers' Trust, Guaranty Trust, Prudential life, Equitable life, Mutual Life and New York Life. As of 1912, these institutions controlled ten large rail systems, three urban railway corporations, U.S. Steel, G.E., A.T. & T., International Harvester, and Western Union. (Kotz, 1978, p. 36) Various studies place differing significance on Morgan's control of stock. Kotz study of 1969 bank control concludes that many of Morgan's main influences had diminished, except for General Electric (Kotz, 1978, pp. 158-191). Even so, using data from 1980, Morgan's place among stockholders seems anything but insignificant, even for corporations in other banks' groupings:

Table 1. Morgan Group's Stock Voting Rank in other major companies in 1980

The "Standard Oil Crowd" created a banking circle all to their own, headed by Rockefeller and Stillman, using accumulating cash from oil refining and sales. National City Bank of New York, and later, Chase Manhattan and Equitable and Metropolitan Life insurance companies would be the main capital institutions from which they would invest in and control various firms. Their main early holdings were in Standard Oil and its affiliates in the U.S. and abroad, and the Union Pacific Railroad, among others. Kotz's 1969 study showed that the holdings of the then "Chase Manhattan" group, included Columbia Broadcasting System (CBS), Boeing, Eastern Airlines, National Steel [auto-related], Northwest Airlines, J.C. Penny [suburbanization-related], Trans World Airlines, United Airlines, Woolworth's [suburbanization-related], Uniroyal Tires [auto-related], and Southern California Edison.

Mellon's group, centered on Mellon National Bank of Pittsburgh, was much smaller than the Morgan or Standard Oil group. Its main early holdings were the Alcoa monopoly [auto-related], Gulf Oil [auto-related], the largest oil producer outside of Standard, and Westinghouse [public-transit and auto – related]. Kotz's 1969 study shows that the Mellon group remained in control of these entities (Kotz, 1978, pp.158-191).

The mid-west banks were important in the early automobile industry and were backers of such suppliers as Firestone tires, and Libby glass (Trescott p. 174). Kotz's 1969 study of bank control shows that major mid-west banks including First National of Chicago, Central Trust of Cincinnati, and National City of Cleveland controlled B.F. Goodrich [auto-related], Federated Department Stores [suburbanization- related], Inland Steel, Kroger [suburbanization-related], Standard Oil of Indiana and Ohio[auto-related], and Firestone Tire and Rubber [auto-related] (Kotz, 1978, pp.158-191).

Interestingly, the "Big Three" automakers remained, for the most part, outside of direct control of these main groupings. Manufacturers' Hanover, with strong connections to the Morgan Group controlled Chrystler Corporation as of Kotz's 1969 study (Kotz, 1978, p. 160). General Motors, for a long time was controlled primarily by the Du Pont family, which owned anywhere from 25 to 50 percent of its entire stock. Interestingly, the Du Pont family was forced to divest from GM for its alleged conflict of interest concerning materials used in automobile manufacturing produced by Du Pont. Ford, by and large was family owned for most of its early history.

This sketch of early and mid-century control by important segments of capital shows that the greater automobile industry, its supporting industries along with other consumer goods producers and retailers were well connected to the heart of United States capital. In fact, practically all of the largest and most dominant firms in the economy are connected via these few capital sources. Seven of the largest banks in the country, Chase, National City, Morgan, Manufacturers Hanover, Bankers Trust, Morgan Guarantee, Mellon National, representing close to 16 percent of all bank assets in 1970 (90 out of 576 billion, or 23.8 percent of commercial banks in 1974), and the 5 largest insurance corporations,

Prudential, Metropolitan, Equitable, New York, and Mutual Life, representing close to 41 percent (86 out of 207 billion) of all life insurance assets in 1970, have a firm economic relationship through ownership and financial backing with the major corporations making up the automobile and related industries.

Forward and Backward Linkages

The growth of the automobile gave birth to a multitude of new industries, and spurred on the expansion of other existing ones. Existing industries important to the automobile included oil, both for refined fuel and for lubrication, large electrical machinery and tools for production, textiles, glass, steel, rubber, and the road building and civil engineering industries. Industries born with the widespread adoption of the automobile were service stations, for both repairs and maintenance as well as for fueling, automobile dealers, the substantial automobile insurance and financing industries, and the growing highway construction and engineering firms.

The oil industry was already among the largest in the U.S. as the automobile rose in significance. Standard Oil, eventually divided by the U.S. justice department after a conviction of monopolistic practices, dominated the oil industry, surrounded by much smaller “independents.” As the automobile developed and its need for fuels and lubrications grew, the interests of oil in Automobile development grew, logically. Along this vein, the two industries would soon band together under issues important to the diffusion of the automobile.

The rubber industry, though in its infancy, was important to the growing auotmobile, which was recognized by Ford and others. Ford, even attempted to built a rubber factory-town and a rubber plantation in the middle of the Amazon forest, which failed. The domestic rubber industry grew, however, and became increasingly incorporated into the main groupings of capital. Midwest banks nurtured both B. F. Goodrich and Firestone, while the Chase group backed Uniroyal, and the Morgan group backed Goodyear. As of 1995, 60 percent of the nation’s rubber production went to automobile related use.

An array of chemicals like paints and sealants would become more important as the bodies of the automobile became more advanced, durable and weather resistant. Du Pont, a major producer of these

chemicals, especially paints and sealants, developed the Duco paint in 1923 especially for the automobile which shortened drying times from 25 to 3 days (Abernathy, 1978, p. 25).

Steel was already in a state of oligopoly by the time the automobile industry flourished, which ironically, hindered for a short period the development of light and stronger automobiles (Denison p. 125). Because of risks and the size of the order needed to make a profit, it took some time to convince steel makers to make the stronger and lighter alloy steels like those being used in Europe. The adoption of larger, closed body styles used more and more steel and required more complex and expensive tools and jigs. As of 1995, 13 percent of the nation's steel output was consumed in automobile production. (Lovins et al., 1995, p. 83).

Eventually, between 1920 to 1954, aluminum pistons and other parts were phased into automobile production. (Abenathy, 1978, p. 188) The aluminum content of the automobile would rise over the next decades and by 1995, 15 percent of all aluminum produced in the U.S. would be consumed in auto production (Lovins et al., 1995, 83), most of which would be supplied by ALCOA.

The growing retail gasoline industries, automobile service industries, dealers, and finance and insurance companies were, by nature, dependent on the growth of the automobile by their nature. Following the lead of the General Motors Acceptance Corporation, formed in 1919, over one hundred automobile finance companies were in operation by 1921. Undoubtedly, many of these were backed through the dominant supplies of capital.

In total, as of 1966, 32 separate industries supplied at least 100 million dollars each worth of goods and services to the automobile industry, 17 of which counted the industry as one of its 4 largest customers, and 9 counted it as its largest (Taebel, D. and Cornehls, J., 1977, p. 66). Iacocca's industry was indeed the national industry.

2. Indirect Financial Networks: The Automobile-Suburban Complex

It is obvious that there are multiplier effects throughout an economy and the growth of one segment, leads to higher activity in others. The effects of the automobile is no different, but there are some connections to be made which are more than arbitrary, and whose nature depend specifically on the character of the automobile as a commodity and a form of transportation. The main aspects of these connections are made through the formation of an entire consumer oriented lifestyle, characterized by the mass consumption of commodities, including the automobile. The creation of a mass consumptive society was seen by Harvey to be intertwined with the early century development of monopoly capitalism itself. As monopoly powers grew to dominate the economy, Harvey claims that:

> …emphasis lay on the joys of monopoly rather than the rigors of competition…
>
> Relieved of the burden of excessive competition in production, the large corporations became much more sensitive to the control of labor power and markets as the basis for a constant and secure flow of revenues and profits. Their attachment to large scale production also led them to direct their attention to mass rather than privileged and custom markets. And the mass market lay within the working class. This was the basis of Fordism. (Harvey, 1985, pp. 202-203)

The framework within which this mass consumptive lifestyle developed was post-war suburbanization. A tremendous volume of work has studied the question of the suburbs. Here, a general discussion of suburban expansion will be given, based chiefly on the work of Gordon (1978), Harvey (1985) and Molotch (1985). Analyses have focused on the growth of the suburbs as satisfying the needs of accumulation in different ways, and, most important for this work, its satisfaction of capital's internal struggle for reproduction via the profit gained from the circulation of commodities into the economy.

The earliest observations by Marx about the motivations of capital to expand geographically can be useful in a broad sense for addressing suburban expansion. Here, as quoted in Harvey, 1985, Marx discusses expansion of capitalism on a global dimension, but the parallels to suburban development are not far fetched: "The need of a constantly expanding market for its products chases the bourgeoisie over the whole surface of the globe. It must nestle everywhere, settle everywhere, establish connections

everywhere…" (Harvey, 1985, p. 32) As central city investments decline, or in general, all opportunities for capital decline, new, fresh sources are needed for investment. New wants and channels for consumption are developed, and in the suburbs, this process is fairly clear. Harvey explains that the suburbs an elegant solution for capital which switched the emphasis of investment and development from the supply side - "Fordism" (productivity and mass production) - to the demand side, or Keynesianism (state-backed mass consumption).

> It was the switch into Keynesian strategies of fiscal and monetary management that consolidated the turn to demand-side urbanization. The trauma of 1929-1945 provided the catalyst. When the depression hit in the United States, Ford, true to his colors saw it as an underconsumption problem and tried to raise wages. Forced within six months by the logic of the market to back down, Fordism failed and had to convert itself (often reluctantly) into state managed Keynesianism and New Deal institutional reforms and politics. For more than a generation, capitalist urbanization was shaped after the added trauma of Word War II into a state organized response to what were interpreted as the chronic underconsumption problems of the 1930s.
>
> The implications for the urbanization of capital were profound. The Keynesian city was shaped as a consumption artifact and its social, economic life organized around the theme of state-backed, debt financed consumption….
>
> The temporal (by credit) displacement of overaccumulation (an excess of unemployed capital) through debt financed infrastructure formation was accompanied by strong processes of spatial reorganization of the urban system. Long reduced to a commodity… land speculation had also been a potent force making for urban sprawl… The means of further dispersal - the automobile - had also been on hand since the 1920s, But it took the rising economic powers of individuals to appropriate space for their own exclusive purposes through the debt financed homeownership and debt-financed access to transport services (auto purchases as well as highways), to create the "suburban solution" to the underconsumption problem. Though suburbanization had a long history, it marked post war urbanization to an extraordinary degree. It meant the mobilization of effective demand through the total restructuring of space so as to make the consumption of the products of the auto, oil, rubber, and construction industries a necessity rather than a luxury. For nearly a generation after 1945, suburbanization was part of a package of moves (the global expansion of world trade, the reconstruction of .. Western Europe and Japan, and a more or less permanent arms race being the other key elements) to insulate capitalism against the threat of crises of underconsumption. (Harvey, 1985, pp. 203-207)

The "Suburban Economic Network"

Much of this section is informed by a study titled "The suburban economic network" edited by John Ullman (1977), where it was concluded that "there existed a suburban economic network, that is, a cohesive set of activities which provides goods and services and which derives its considerable political strength from the consumers of the goods and services, as well as the producers." Here, we are concerned with the industries, which, along with the automobile, benefit from suburban development, and in this sense, have an interest in the diffusion of automobile technology.

The diffusion of the single family detached home and the suburban lifestyle brought along with it a substantial boom in the consumption of large household durable goods. These goods, generally used more communally in denser environments, include home laundry equipment, central or room air conditioners, home water heaters, lawnmowers, and countless others like outdoor furniture, snow blowers, burglar alarms, barbecues, tools sets, etc. The first few are virtually synonymous with low density, suburban living, and can be associated with the adoption of the automobile.

Many of the home durables existed for some time before the post-war suburbanization boom, but a clear explosion in their consumption took place between the end of the war and the 1974 recession. In quantifying the relationship between these sales and suburbanization, Ullman calculated that consumption of these goods is done in single family homes at a rate 12 times that of multifamily and apartment units (dependent of course on the density of the multifamily unit considered). Figure 2 shows how growth of the sales of these goods outpaced the growth of the population.

Figure 2. The growth of sales of durable goods from 1945 to 1975. [Ullman, 1977]

The connection to other supplier industries is interesting as well. Each dryer uses approximately 133 pounds of steel, each home gas and oil heating equipment uses 500 pounds of steel, 11 pounds of aluminum and 10 pounds of copper, and each washer, 140 pounds of steel. (Ullman, 1977, p. 160).

Copper and steel are principal industries in the Morgan and Chase groups, as aluminum is in the Mellon group. The total consumer outlays, in 1972 prices, for all of the equipment purchases between 1946 and 1972 came to 136.8 billion dollars. (Ullman, 1977, p. 160). Specifically, it was the firms of Westinghouse, General Electric, and Frigidair who benefited from these consumption developments. The first two of these firms have direct connections with the Mellon and Morgan groups, respectively, and the third is owned by General Motors itself. Undoubtedly, these exploding consumer markets were a boon to most major industries, whether or not they were connected directly with the automobile.

The Overall Economy

It is hard to refute the significance of suburbanization in the growth and sustenance of the U.S. economy between World War 2 and the 1974 oil crisis. Indeed, in keeping with the Keynes' theory of tight monetary control and unbridled government deficit spending, the push of suburbanization by state backed financing and infrastructure, seemed to work, for a time. The growth in the economy as a whole during the period was unprecedented in history, and nearly every segment of the economy benefited. Harvey, (1985) goes as far to say, "It is now hard to imagine that postwar capitalism could have survived, or to imagine what it would have now been like, without suburbanization and proliferating urban development." (Harvey, 1985 p. 207)

The largest industries comprising most of the oil, automobile, steel, consumer durable goods, etc. have been shown to be firmly linked with each other both by necessity and via broader developments in the economy like suburbanization and the expansion of mass consumption. These economic links are important, but take on a different light when considering the various political activities used to bolster and take advantage of the economic powers available. This next two parts will show how the various firms organize to more effectively reach their goals. These processes will be discussed along two broad categories: direct inter-corporate communication, and the policy formation process.

3. Inter-Corporate Management: Interlocking Directorates

The importance of interlocking corporations via shared management and directors is debated. For the purposes of this work, however, inter-corporate communication and cooperation seem important and the subject of interlocking corporate officers and directors is potentially useful. In the past, interlocks have been condemned as sources of trust behavior, conflicts of interests for the interlocking directors, and for their potential to debase the quality and breadth of corporate directors. Here, we are mainly concerned with the first issue, the significance interlocking corporate directors and managers have in the coordination of firms' behaviors.

Before showing the substantial interlocking among corporations, we must establish the significance of corporate directors in shaping firm behavior. The role of the board varies from company to company, so the significance of interlocks might vary accordingly. According to Alfred P. Sloan, then director of General Motors:

> …The board, of course functions as boards of large corporations usually do, in good part through its committees. There are four such committees in GM, each of which is composed exclusively of directors, authorized to exercise the power of the board in management of the business and affairs of the corporation… It (the finance committee) has authority over all capital appropriations and over entrance into any new line of business… The executive committee is responsible for operating policy… The board deals with the corporation's affairs before the fact through projections of what we hope to accomplish and after the fact through evaluation of reports and other data; and it is prepared to take action where needed." (Sloan)

If boards exercise meaningful and significant control over a firm, as Sloan indicates, then it would be a component of control used by a firm having a financial or policy interest in another. Indeed, taking the interlocking data from Subcommittee on Antitrust (House of Representatives Committee Antitrust Subcommittee, 1965) and picking out the several corporations with financial interests (some degree of ownership or stock control) in another, a higher than average number of director interlocks was found. Where firms have a heightened interest in the operations of another (in this case the firms have stock control), they seem to use interlocking directors as one means of control, though the data set available

was very small. Certainly, in terms of communication and coordination, overlapping directors or managers would seem to be very important.

A multitude of studies have covered the complex array of corporate director interlocks, and here we will take a brief look at four, from 1935, 1938, 1946 and 1962.

In 1935 the National Resources Committee studied the board members from the 200 largest non-financial (including all of the major auto, oil and supplier firms) and the 50 largest financial firms (including all of the capital sources connected to automobile and related firms) at the time. Of the 250, only 25 had no director in common with another, and of the 3,455 total director positions, 400 people held nearly one third, and 1000 over one half. Of the 250 firms, 151 had interlocking boards with more than 3 others. (National Resources Committee, 1935)

The massive 1938 30+ volume study of the economy by the Temporary National Economic Committee (TNEC) on the Concentration of Economic Power focused one study on the growing life insurance industry. It was found that the 135 board members from 5 central insurance companies served on the boards of 100 other insurance companies, 145 banks and other financial institutions, and 534 "industrial, real estate or miscellaneous corporations. On average, each of the 135 was a director of six other corporations." (TNEC, 1941)

In 1946 the Federal Trade Commission did an investigation into interlocking directorates among the 1000 largest manufacturing and 330 non-manufacturing corporations. The results for these companies were similar. In considering just the 25 largest corporations, General Motors was found to have interlocks with 10 of the remaining 24, the most in the group. (Federal Trade Commission, 1951)

In 1965, the House of Representatives Committee Antitrust Subcommittee performed an analysis, based on data from the end of 1962, of interlocks among the 20 largest industrials, the 15 largest banks, the 10 largest mutual savings banks, the 10 largest insurance companies and the 10 largest fire and casualty insurance companies, with 9 companies added to the sample because of their significance to their particular industries (A.T.&T., American Motors, for example). The 28 industrials represented 22.1

percent of sales, 26.9 percent of assets, and 36.4 percent of profits for all U.S. manufacturers. The 10 oil companies represented, made up 85.3 percent of industry sales, 59.9 percent of assets and 82.4 percent of industry profits in 1962. The two steel producers included made up 29.7 percent of industry sales, 36.9 percent of assets, and 55.5 percent of industry profits. And GM, Ford, Chrysler, and AMC all included in the sample, constitute 79.3 percent of sales, 77 percent of assets, and 91.2 percent of profits for the automobile industry in 1962 (House of Representatives Committee Antitrust Subcommittee, 1965, p. 115). Of the 28 industrials, only 1 has no interlocks with none of the others in the sample. For the main oil, auto, steel, and durable goods producers, the numbers of interlocks within the group of industrials, banks, and insurance companies in the sample are shown below in Table 2.

Table 2. Interlocks between various firms and firms of different types.

A later study by Allen, quoted in Dye (p. 169) concluded that banks tended to serve as focal points for directorate networks, and that Morgan Guaranty, Chemical Bank, Mellon National, National City Bank, Met Life and Chase Manhattan were seen as the major kingpins for the most powerful national level groupings.

4. Political Organizations: The Policy Formation Process

Outside of direct corporate interlocks, firms participate in or support several types of organizations in order to communicate, develop policy and strategies, and resolve conflicts. Domhoff refers to this as the policy formation process, since its main aim is to create and affect public policy. The process combines several different kinds of organizations:

1. Focused industry groups like the Automobile Manufacturers Association or the Automobile Service Industry Association formulate policy and lobby congress over specific issues related to automobiles
2. Broader groups, such as the Committee for Economic Development or the Business Roundtable, which deal with more general national issues like trade or labor legislation.
3. Research oriented groups like think tanks and university research units.

Lobbying by industry groups and sometimes even the individual corporations themselves is fairly straightforward and doesn't need much discussion. The main impetus behind such actions are to make short term and narrow sighted advantages, including tax breaks, affecting regulatory processes, self serving advice to government agencies, and affecting small but important congressional committees (especially conference committees) meeting on important bills (Domhoff pp. 25-60).

The Oil industry has a long history of power in Washington, and the American Petroleum Institute, one of the main lobbying groups, is also one of Washington's richest and largest, employing 350 people and dispensing 50 million dollars annually to lobbying efforts. The automobile lobby can include many diverse groups depending upon the political circumstances. Groups like the Automobile Manufacturers Association, the Motor Vehicles Manufacturers Association, the National Automobile Chamber of Commerce, the American Automobile Association, work on legislative issues directly affecting the accommodation of the automobile, including financing issues, highway construction, and environmental legislation.

Multi-industry groups focused on automobile or highway transportation include the National Highway Users Conference (NHUC), now the Highway Users Federation for Safety and Mobility, which did not involve itself in direct lobbying efforts, but instead coordinates the major industries' associations into one cohesive conference. NHUC sought to combine the forces of the oil industry via the American Petroleum Institute, the automobile and truck manufacturers, via the Motor Vehicle Manufacturers Association, the trucking industry, via the American Trucking Association, the tire industry, via the Rubber Manufacturers Association, and the nation's automobile users, via the American Automobile Association. Its function was to influence congress and state legislators where it claimed "the membership may be badly informed or where a considerable part of it may yield to the influence of selfish interests." (Snell, 1974, p. 44) Building for the passage of the 1956 Interstate Highway Act, "NHUC and allied groups worked assiduously building support among congressman, federal administrators, academicians

and engineers. They contributed to congressional campaigns, placed their members in important administrative posts and granted millions of dollars in highway research (Snell, 1974, p. 45).

The national level policy formation groups take on several forms. Some do lobby directly while most remain focused on national objectives above and beyond what could be affected by any single congressional action. Several of these policy discussion groups have been involved in issues regarding the automobile industry, but much less so. The Business Roundtable, the U.S. Chamber of Commerce and the National Association of Manufacturers played a key role in forming a unified defense for the automobile industry during the Clean Air Act amendments of 1977, organizing such diverse groups as the National Association of Realtors, Building Owners and Managers, Independent Council of Shopping Centers and retailers like J.C. Penny, Wards and Sears, where "virtually every one of them had an important financial interest in maintaining the existing pattern of urban land use, with its extensive reliance on automobile transportation." (Vogel, p. 351)

Finally, "think tanks" like the Brookings Institute and the Heritage Foundation and important university research units serve as well to do much of the basic problem solving and research necessary to advance the techniques and the state of the arts needed by the dominant actors in the economy. Indeed, in term of transportation, a tremendous amount of advanced research has been and is being done relating to solving the most important problem facing the diffusion of the automobile. In the early part of the century it was addressing the problems of road building and highway design, basic combustion engine science, and industrial organization, to name just a few. Now, advanced research addresses current concerns of emissions, energy use, advanced manufacturing processes, control systems, congestion (pricing and automated highways), and even solving the social inequities resulting from the sprawling urban form facilitated by the automobile. Even this year, the Reason Foundation produced a set of policy directives advocating for a massive expansion of highways in the United States, warning of the growing congestion in the coming decades if action were not taken. Solving, technically and academically, many of the problems associated by the automobile puts the university and the think tank in a unique position to lower

barriers to automobile diffusion as well as act to transfer funds and knowledge from public sector endeavors (DOE, DOT, DOD, NSF) to private activity and accumulation.

5. Motivations for Policy Control: Demand Management

We have seen how the automobile-related firms and related industries grew up together into a tightly organized group. At the same time, public finance and policy was also growing and having a great and greater influence on the development of the United States. Together, these two forces: private and public growth could reinforce each other and help to sustain the growth, prevent stagnation, and lead to unimaginable levels of development. Since many of the automobile and their related firms operated in a monopoly of sorts, their needs for planning and public assistance were geared towards stability and demand management.

The work of both Abernathy, in his Productivity Dilemma, and Galbraith in The New Industrial State point, from very different directions, to the growing importance *planning* has taken in shaping modern firms' economic behavior. Abernathy studies the development of manufacturing processes from a technical point of view and finds that, "production processes, designed increasingly for efficiency, offer higher levels of productivity, but they also become mechanistic, rigid, less reliant on skilled workers, and more dependent on elaborate and specialized equipment." This leads to a conclusion, in part, that, "high rates of productivity have come at a cost - a declining capacity for major innovation." (Abernathy p. 4)

Abernathy's findings become more important put into the political-economic context of how the automobile centered economy might behave. Galbraith, in essence, arrives at the same conclusions from an economic analysis. The explosion in technology applied to processes of production, in the growing size of firms needed to manage and command such complexity, and in the amount of capital demanded and risked in any endeavor thus pursued, has brought about a new class of managers at the head of today's industrial system. Galbraith argues, "the decisive power in modern industrial society is exercised not by capital but by the industrial bureaucrat." (Galbraith, p. xv) Galbraith establishes that, given the

oligopolistic nature of the economy, prices are set, and the concern for maximum profits becomes secondary to other needs. Harvey, 1985, from a Marxist standpoint, agrees: “Relieved of the burden of excessive competition in production, the large corporations became much more sensitive to the control of labor power and markets….” Thus the rising concern in commanding increasingly complex and capital intensive processes shifts from profit and accumulation to the ability to plan.

This planning function, akin to a state, is what Galbraith goes on to theorize as the “New Industrial State.” While his arguments are varied, they are strongly corroborated by Abernathy’s conclusions. That industrial processes are so complex, costly, time consuming, exacting in precision, and demanding in specialized knowledge, makes changing them or adapting them to new market forces risky and potentially fatal to a firm. Thus, Abernathy’s concluded that “a declining capacity for innovation” arises, and that rapidly changing market conditions are undesirable, very difficult to adapt to, and must be avoided. Effectively, planning both the firm’s consumption activities, in terms of suppliers, and production activities, in terms of consumers, becomes essential.

The importance of the state grew to be very significant during the period of the adoption of the automobile. Baran and Sweezy are explain which this means during this period of the growth of monopolies:

> “under monopoly capitalism, the function of the state is to serve the interests of monopoly capital…. With every advance of monopoly…the federal government becomes more subservient to it, more dependent on it, more disposed to favor it with grants of privilege, protection and subsidy.” (Baran and Sweezy, 1968, p **)

In essence, the state seeks to guarantee stability to investment, which, because of the needs of firms, means stability in markets. These Keynesian policies directed towards countering the increasingly dangerous cycles of depressions and booms would become the hallmark of the post war U.S. State. This translated into policies directed towards nurturing consumption in certain important industries, through policies like subsidizing massive amounts of credit (home mortgages and general deficit spending), investing in built environments (highways) which foster consumption or productivity. The growth of the

public sector was impressive, and federal government spending ballooned from around 10% of GDP in 1903 to over 30% in 1972. The growth in the GDP, government spending and the rising concentration of the industrial firms can be seen in Figure 3.

Figure 3. The growth of economy and government spending from 1903 to 1972.

Being a favored investment and being so closely tied to nearly every other growth sector in the economy at a time when federal investment in infrastructure is ballooning was a large source of advantage for the automobile.

Conclusions

This paper has attempted to show how tightly concentrated the economy had become by early to mid-century, and how the automobile, related and dependent industries and other consumer goods sectors who's growth also depended on suburbanization, were so intimately linked. An assessment of the secondary evidence presented, shows that this approach has some validity. There are not only many smoking guns, but the presence of a "motive" is overwhelming. While the automobile companies themselves largely stayed out of direct financial control of other firms for most of their history, the evidence concerning shared directorates paints an overwhelming picture of a large sphere of influence and of overlapping interest. Perhaps the weakest link concerns the indirection connections via industrial networks, yet this evidence points to the synergies between economic growth, suburbanization, and the automobile – perhaps one of the most powerful postwar processes and the source of the biggest economic boom in the history of the world. The motivation for demand management illustrated in the last section gives some superficial, but strong, evidence that in the presence of sufficient political clout, the desires of the industry would be to control demand and steer urban planning towards a car-dependent paradigm.

The policy formation process is now called into question in order to draw conclusions about what effect, if any, all of this organization and motivation had on real planning and public spending. The record speaks clearly on this issue: countless hundreds of billions of dollars spent on the interstate system and other non-interstate freeways and roadways, countless hundreds of billions spent privately on automobiles and maintenance and fuel, and countless hundreds of billions in external costs tolerated and accommodated – health impacts from air quality, traffic deaths and injuries, billions per year in congestion costs, among many more – to continue on with this now status quo planning paradigm.

The goals of this paper were not to review the vast record of policy interventions made on the part of the automobile – the extreme dependence illustrated in the opening section was there to state that this was the case – a clear result of years of policy interventions. To just review a few would suffice, while the cases of direct policy making in favor of the automobile are numerous. During the period in question – from around 1920 to the 1970s – demand management through public infrastructure investments took several forms. Road building at the local level was obviously significant. Federal support for freeways and interstates allowed longer distance commuting and suburban expansion and is a better illustration of the policy interventions needed by the automobile network to control demand. Quoting Sawers (1984, p. 236):

> The federal government had been subsidizing highways since 1916, but these funds were mandated for rural areas only. Federal urban road building efforts increased dramatically in the 1930s and were financed by the Works Progress Administration and the Public Works Administration as part of the larger depression-fighting campaign. The WPA spent 38 percent of its budget on roads and highways and almost nothing on other forms of transportation. The PWA's grants for highways were highways ten times the size of those for subways (Foster, p. 65). In 1944 the federal government specifically included urban areas in the funding of highways. A great leap forward was taken along this road in 1956 with the introduction of the Interstate Highway System, which finance urban expressways. But the mold had already been set in the 1920s and 1930s.

The Clay Committee, in charge of developing a proposal for the Interstate Highway System which was eventually modified by congress, contained representatives of some of central actors in the automobile centered economy. Its namesake, General Lucius D. Clay, was also on the board of General Motors, and the committee contained Francis du Pont, with obvious connections to the Du Pont family, a supplier to the automobile industry (Weingroff, 1996), and Steve Bechtel of the Bechtel Corporation (Civil

Engineering), Sloan Colt of Bankers' Trust Company, Bill Roberts of Allis-Chalmers Manufacturing Company (Civil Engineering) (Weingroff, 2005). But hese connections, however, are just more obvious illustrations of what is being argued to be systemic and institutional at the core of the culture and economy.

This paper has shown a substantial level of organizing and power and influence, combined with a motivation to shape demand, and some evidence of how policy was influenced. How much of the positioning of the automobile industry contribute to its favorable treatments, and how much do the other theories add to this explanation? Certainly, the influence of planners with concrete visions of suburban development was necessary. Certainly the decline of the transit industry, either from early competitive struggles or via harsh regulation, was important in order to free up road space and ease early congestion problems which plagued car adoption in many cities. And the anti-trust activities did play a role in finalizing transit's demise (see Appendix 1 for a short synopsis of the anti-trust charges). The argument here is that these things all were figments of having an industry so central to the entire fabric of the economy, that it was indistinguishable from it. The very ideas of "growth" and "progress" were redefined to mean the increased dependence on the automobile.

Competition with transit was real and vigorous, earlier in this process, but arguably, by the mid-1920s, the writing was on the wall. To quote from Whitt and Yago (square bracketed additions by the author):

> … the impact of earlier mismanagement by local transit monopolies was devastating for equipment manufacturers (Hilton and Due, 1960). The railway equipment industry had peaked and the absence of significant levels of new private or public involvement meant that an already limited market contracted further. Meanwhile other supplier industries also were in eclipse or transformation. The coal, steel and public utilities industrial complex, which comprised the leading growth sectors of pre-World War I economy, changed (Duncan and Lieberson, 1970). As a newly regulated industry, public utilities were buffeted by investigations and scandals leading to the Holding Company Act of 1934. Coal and Steel reoriented their production towards the growing auto and construction sectors. And electrical machinery manufacturing shifted from capital to consumer goods production. Relatively, the overall position of these industries declined.
>
> …The fragmented nature of locally owned transit systems in the U.S. facilitated successful penetration of this corporate strategy in local transportation development [referring to conversion of rail to buses]… As noted earlier, industrial groups that might have opposed this corporate strategy either were now dependent on this [automobile-centered] growth coalition, or had little remaining power. For example, other transportation equipment producers, such as Dr. Thomas Conway, the Brill Company, Westinghouse and other streetcar lines, opposed conversion. Throughout the 1930s Conway called meetings to defend rail line and to popularize the use of modernized streetcars that would reduce operating costs. However, the attempts of equipment producers and users to inform and convince civic groups concerning the merits of modernized streetcar equipment were quashed by superior economic and political power of GM and its allied companies. (Whitt and Yago, 1985, pp. 47 to 48)

The problem for the automobile industry was not transit, but shaping and controlling the demand for its products through manipulation of public policy and investments. Consumption was the problem. Until the anti-highway movements developed in the 1960s and 1970, this model of growth with the automobile at its center would go basically unopposed, resulting in the extreme dependence we see today in the United States.

References:

Abernathy, W. (1978) *The Productivity Dilemma.* Johns Hopkins University Press, Baltimore.

Ashton, P. (1984). "Urbanization and the Dynamics of Suburban Development Under Capitalism," in Tabb, W. and Sawers, (eds) *Marxism and the Metropolis*, Oxford University Press, New York.

Baran, P and Sweezy,. (1968) *Monopoly Capital: an Essay on the American Economic and Social Order.* Monthly Review Press, New York.

Bianco, M. (1997) The decline of transit: a corporate conspiracy or failure of public policy? : The case of Portland, Oregon. *Journal of Policy History*. Vol. 9, no. 4.

Bianco, M. (1999) "Technological Innovation and the Rise and Fall of Urban Mass Transit." *Journal of Urban History*, Vol. 25, no 3, pp. 348–378.

Cervero, R. (Citation Lost)

Denison. (1956) *The Power to Go.* Doubleday, Garden City, N.Y..

Domhoff (1990) *The Power Elite and the State: how policy is made in America.* A. de Gruyter, New York.

Federal Trade Commission (1951) *Report of the Federal Trade Commission on interlocking directorates.* U.S. Government Printing Office, Washington, D.C..

Flink. (1975) *Car Culture*. MIT Press, Cambridge, Mass.

Foster, M. (1981) *From Streetcar to Superhighway*. Temple University Press, Philadelphia. Chapter 8, pp. 151-176.

Galbraith, J. K. (1978) *The New Industrial State, 3rd Edition*. Houghton Mifflin Company, Boston.

Glasscock (1937) *Motor History of America.* Bobbs-Merrill Co., Los Angeles.

Gordon, D. (1978) "Capitalist Development and the History of Cities," in Tabb, W. and Sawers, (eds) *Marxism and the Metropolis*, Oxford University Press, New York.

Leavit. (1970) *Superhighway - Superhoax.* Doubleday, Garden City, N.Y.

Harvey, D. (1985) *The Urbanization of Capital*. Johns Hopkins University Press, Baltimore.

Kerbo, H. (1996) *Social stratification and inequality: class conflict in historical and comparative perspective.* McGraw-Hill, New York.

Kotz (1978) *Bank control of large corporations in the United States.* University of California Press, Berkeley, Ca.

Logan, J. and Molotch, H. (1985) *Urban Fortunes: The Political Economy of Place.* University of California Press, Berkeley.

Lovins, A. and Lovins, H.. (1995) “Reinventing the Wheels,” *The Atlantic Monthly*, January, pp. 75-85.

National Resources Committee (1935) (Citation Lost)

O’Connor, H. (1955) *The Empire of Oil*. Monthly Review Press, New York.

Pennings (1990) *Interlocking Directorates : origins and consequences of connections among organizations' Boards of Directors*. Jossey-Bass, San Francisco.

Pisarski, A. (2006) *Commuting in America III*.

Sawers, L. (1984). “The Political Economy of Urban Transportation: An Interpretive Essay,” in Tabb, W. and Sawers, (eds) *Marxism and the Metropolis*, Oxford University Press, New York.

Sloan, Alfred P.. (1964) *My Life with General Motors*. Doubleday, New York.

Snell, Bradford C. (1974) *American ground transport; a proposal for restructuring the automobile, truck, bus, and rail industries, by Bradford C. Snell.* Presented to the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, United States Senate. February 26, 1974. U.S. Government Printing. Office, Washington, D.C..

Tabb, W. and L. Sawers, eds. (1984) *Marxism and the Metropolis. New perspectives in urban political economy*. Oxford University Press, New York.

Taebel, D. and Cornehls, J. (1977). *The Political Economy of Urban Transportation.* Kennikat Press, Port Washington, N.Y..

Temporary National Economic Committee (1941) *Investigation of concentration of economic power. Hearings before the Congress of the United States, Seventy-fifth Congress, third session.* U.S. Government Printing. Office, Washington, D.C..

Trescott (1963) *Financing American Enterprise: the story of commercial banking.* Harper & Row, New York.

Ullman, John E. (ed.). (1977) *The Suburban Economic Network: Economic Activity, Resource Use, and the Great Sprawl.* Praeger, New York.

United States Congress. Senate Committee on the Judiciary. Subcommittee on Antitrust and Monopoly (1964) *Hearings before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, United States Senate, Eighty-ninth Congress*, U.S. Government Printing. Office, Washington, D.C..

Vogel (Citation lost)

Weingroff (1996) “Federal-Aid Highway Act of 1956: Creating The Interstate System.” *Public Roads*, FHWA. Summer 1996· Vol. 60· No. 1

Weingroff (2005) “General Lucius D. Clay: The President's Man.” http://www.fhwa.dot.gov/infrastructure/clay.htm FHWA. accessed on 4/12/2007.

Whitt (1982) *Urban Elites and Mass Transportation: The Dialectics of Power.* Princeton University Press, Princeton.

Whitt, G. and Yago, G (1985) “Corporate Strategies and the Decline Of Transit In U.S. Cities. Urban Affairs Quarterly,” Vol. 21, no 1, September, 1985, pp. 37-65.

Yago, G. (1984) *The decline of transit: urban transportation in German and U.S. cities, 1900-1970.* Cambridge University Press, New York.

Appendix 1: Anti-Trust Activities

Even after the introduction of Chairman Sloan's programs at General Motors to offer a multitude of styles in a variety of price classes, introducing the pressure of annual style changes, pioneering the financing of automobile purchasing, and revolutionizing marketing strategies and processes, the industry was still met with chronic underconsumption. Though early on it was more an effect of the economic crisis of the early 1930's, underconsumption of automobiles did not completely disappear. Even after the recovery period of the late thirties, automobile sales never again reached even the saturated levels of the mid to late twenties. Yago explains the outset of the problem and its solution:

> "But Sloan was wrong. Refinements in automobile production and distribution were not enough… The stagnation of automobile demand, overproduction and the lack of "articulate consumers," and general indicators of economic crisis all required the automobile industry and its partners to develop a new corporate strategy: Urban rail transit was replaced by motor buses, which were replaced by cars. (Yago, 1984, p. 58)"

The actors and the processes underlying this process are very complex, and a detailed description of it is not needed here. Suffice it to say that the evidence, which will be summarized below, was enough for the U.S. Justice Department to convict the consortium, headed by General Motors. Most of the work to uncover this process was done for the Justice Department's Case by Senate Antitrust Committee counsel, Bradford Snell. Later, benefiting from the Freedom of Information Acts' declassification of important FBI files, Glen Yago added more detailed and previously hidden evidence supporting the case. The following is basically paraphrased from Cornehls and Taebel's description, (Cornehls, pp. 70-72), augmented with some of Yago's findings.

The process began in 1925, with GM's acquiring of Yellow Coach, the largest producer of buses, followed one year later by the formation of the interurban bus system, Greyhound. Greyhound, with an exclusive purchasing contract with GM, began to replace the major railroads' commuter rail services, through a system of pressure and agreements for coordination of intercity traffic. By 1950, about half as many intercity passengers traveled Greyhound as on all the railroads combined. GM was heavily involved in this operation, supplying Greyhound with funds in times of need, and as the first ranking stockholder until 1948, when the stock was divided and sold to GM officers (presumably to avoid detection).

At the same time, focus was placed on intra-urban transit passengers, especially the significant urban electric transit systems. GM began a program of purchasing and scrapping the lines and replacing them with buses, through the holding company, United Cities Motor Transit (UCMT). The replacements with bus systems made by UCMT were then sold back to local operators with exclusive bus purchasing

agreements with General Motors. The program was eventually discontinued after censure from the American Transit Association.

In 1935, GM, via its stock control and interlocking directorates with the Omnibus Corporation, converted New York's electric street car system, taking only 18 months. Soon, after this success, GM set up another holding company, National City Lines (NCL), which operated along the same lines as UCMT, this time, with funding from such giants as Standard Oil, Firestone Tire and Rubber, Phillips Petroleum, Standard of California, and Mach Truck. NCL resumed, in the same vein as UMCT to purchase existing electric lines, and replacing them with buses, insuring exclusive contracts with the backing companies. Interestingly, a review of the remaining documentary evidence shows that the executives involved recognized the problems concerning the "propriety and perhaps legality" of such arrangements, especially those concerning the binding contracts locking systems into the purchasing of buses only, with strict prohibition of using any other vehicles or fuel types. In all, dozens of cities lost streetcars to buses during this process.

The operation comes to life when reviewing some of the intercorporate communications concerning the arrangements. The following, written from the assistant treasurer of Firestone Tire and Rubber to the assistant treasurer of Phillips Petroleum, describing some relevant negotiations,

> I have been hob-nobbing with Roy Fitzgerald [National City Lines] and some of the others who are interested in our proposition. I also understood, as you advise, that General Motors and Mack Truck were in and also that Standard Oil of New Jersey and Standard Oil of Calfornia were in. Vic Palmer [Standard of California] was in New York when I was there, as well as Mr. Taylor of Standard Oil of New Jersey… Everything seems to be going along very nicely and I do think we will probably all benefit by the arrangement. (Yago, 1984, p. 60)

In some cases, pains were taken to disguise the ownership of holding companies like National City Lines, as evidenced in the following communication between an executive of NCL and the Vice President of GM,

> It is highly probable that your company will desire to take these blocks of stock in the name of nominees. By doing so, you would avoid becoming a 10% holder of record of any class of stock and hence would avoid the necessity of filing any contracts subsequently entered into between yourselves and our company with the S.E.C. (Securities and Exchange Commission) and the two exchanges. (Yago, 1984, p. 61)

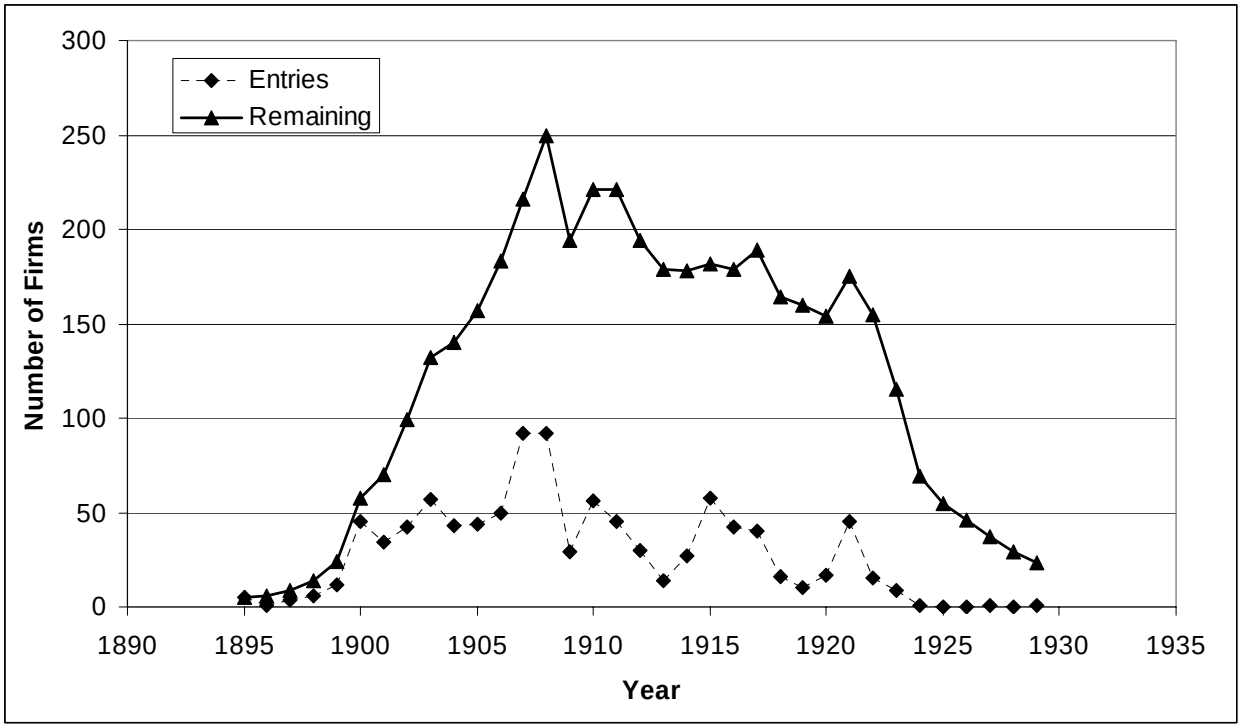

Figure 1. The rise and fall of automobile firms during the first decades of the industry. [Denision]

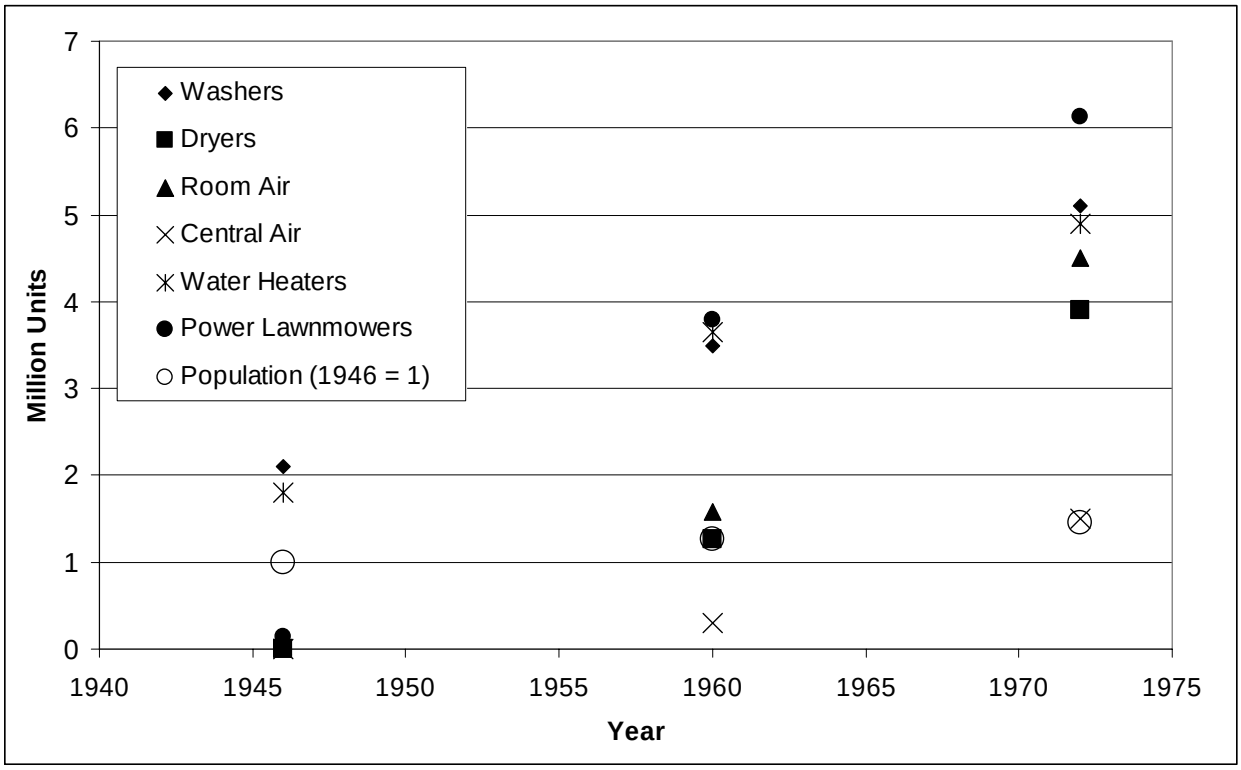

Figure 2. The growth of sales of durable goods from 1945 to 1975. [Ullman]

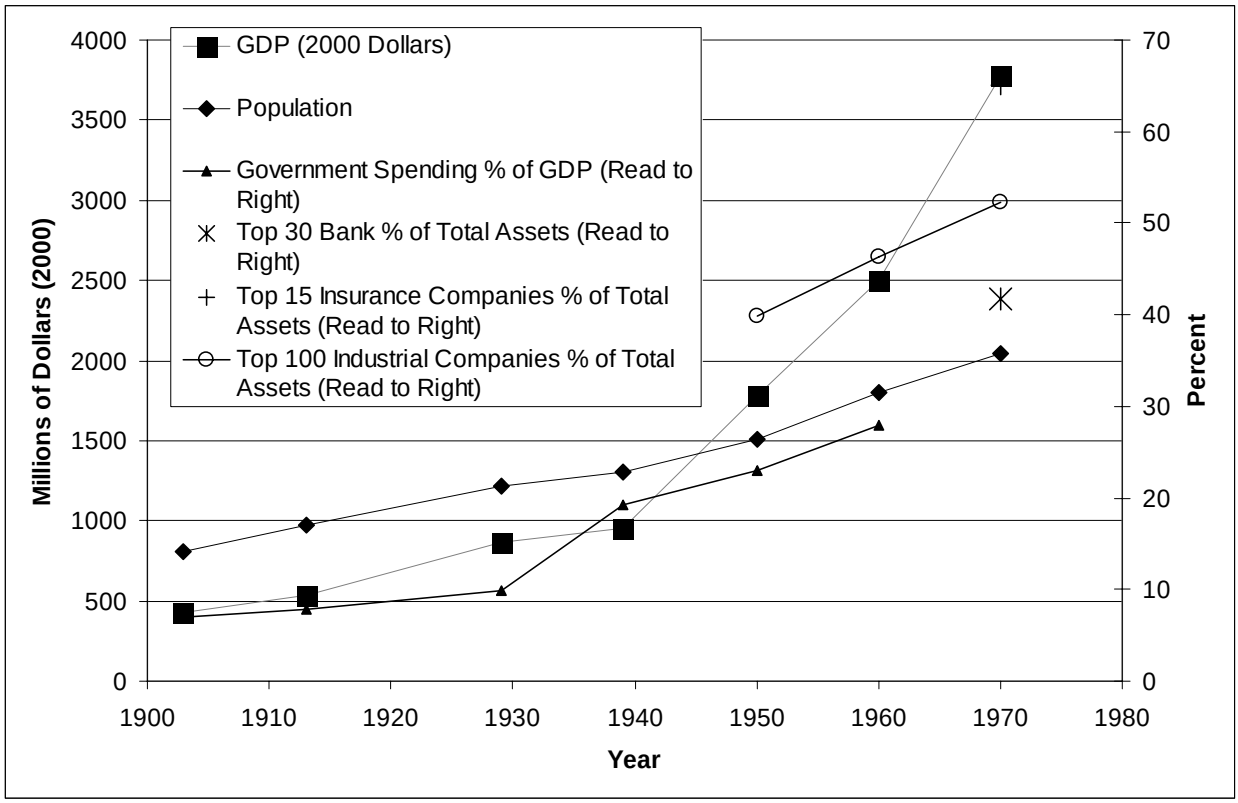

Figure 3. The growth of economy and government spending from 1903 to 1972.

Table 1. Morgan Group's Stock Voting Rank in other major companies in 1980. (Kerbo, 1996, p. 122)

Company	**Morgan's Stock Voting Rank**
Banker's Trust	1
Federated Department Stores	1
General Electric	1
Goodyear Tire and Rubber	1
Kmart Corp	1
Citibank	1
Manufacturers Hanover	1
Mobil	1
Sears	1
U.S. Steel	1
Westinghouse	1
Exxon	2
GM	2
J.C. Penny	2
ABC	3
Du Pont	3
Ford	3
Standard of California	3
Gulf	4
Texaco	4

Table 2. Interlocks between various firms and firms of different types.

[Subcommittee on Antitrust, 1964, table 10, p. 117]

Firm	**Banks**	**Insurance**	**Industrials**	**Total**
Westinghouse	19	7	62	88
U.S. Steel	20	10	58	88
G.E.	20	14	47	81
General Motors	23	4	33	60
Ford	12	3	39	54
Chrysler	12	9	32	53
Texaco	16	7	25	48
American Motors	10	2	21	33
Gulf	5	1	24	30
Shell Oil	2	5	15	22
Mobil Oil	11	2	7	20
Standard Oil (N.J.)	3	1	2	6