

The Market Power of Technology; Understanding the Second Gilded Age
A Summary of the Book
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The book studies the effect of technology and policy in causing the high inequality and increased division in our contemporary society. Because the topic is of great interest with strong public policy implications, it has a wide audience. It is of interest to professional economists in academia and in the private sector, and it is relevant to policy makers engaged in antitrust legislation, patent law, labor legislation and taxation. However, it is also of interest to the general educated public. In writing the book I took into account the needs of this complex audience. Being a serious academic study it has some technical chapters that use mathematics and statistics and is written for specialists, but aiming to avoid the dry style of academic writings, the entire book is written in a more relaxed style. To address the wider audience I wrote a long first chapter designated "Chapter 0" that, in 41 pages, offers a detailed plain-English and non-technical description of all the arguments and conclusions of the book. I also provide a description of a path for non-technical reading of the book. For this reason it is possible for a non-technical reader to be able to fully understand my arguments and conclusions.

My book studies the effects technological market power that results from private ownership of technological knowledge. Such monopoly power over technology ultimately translates into market power over the marketing of goods and services. I argue that changes in such market power of firms is a central cause of changes in income and wealth inequality with significant cultural and macroeconomic effects. The crucial observation is that technological innovations, that are the essence of growth, also perpetually create new market power because innovators own their new innovations and can prevent others from using their technology. Virtually all economists believe that market power created by innovations is temporary because patents expire and it is ultimately a small price to pay for innovations' great benefits of raising productivity and increasing living standards. I demonstrate that such market power is neither temporary nor does it have small social and economic effects.

Once firms gain the advantages of winning a technological race with their innovations, their market power is consolidated and is expanded. It is accomplished by the use of multiple strategies, such as regular updates of their technology, building "patent pyramids", acquiring competitors and extracting private information unavailable to potential entrants. Virtually all research done by others shows that once a firm with a well-entrenched monopoly position, it can defend its position against potential entrants. This implies that market power is a permanent fixture in the age of technology. Rising market power increases the share of monopoly profits in the firm's income, and lowers the shares of capital and labor, resulting in rising inequality - both functional (among labor, capital and profits) and personal (among individuals). I demonstrate that after accounting for depreciation, obsolescence and finite life of patents, only public policy to restrain market power can prevent such power from rising, and the shares of capital and labor from declining to levels that are incompatible with democracy.

To assess the macroeconomic effects of rising market power, I build a growth model with market power which changes by the two forces of technology and policy. Cumulative technological innovations increase market power while policy determines the speed at which market power dissipates. The model demonstrates that rising market power causes a decline in the aggregate levels of capital, output, consumption and investment. Rising market power also enables powerful firms to impede the growth and innovations of their competitors, therefore an economy with high market power tends to become less innovative and have a slower growth rate. I estimate the model's parameters with U.S. data for 1889 -2017 and these estimates show that during the First Gilded Age and since 1981, market power rose rapidly and converged to a high

long-term level. In contrast, during the Reform and New Deal periods from 1901 up to 1981, market power declined slowly and converged to low long-term level. I then show that unexpected shifts of policy result in long periods of rising or falling ratio of capital to output, at different speeds, with drastic effects on actual investments, consumption and output growth rates.

It is a common view that competition and “creative destruction” will eliminate market power, and many even take the position that the very large firms should not be regulated because they are the most efficient firms and regulating them amounts to punishing the most efficient for being the most efficient. In contrast to these views I show that technological competition is very different from regular competition. In regular competition anyone can enter, produce and sell at lower than the high price that prevails in the market, allowing many to survive without excess profits. For a new firm to enter an industry which is in technological competition it must first innovate (which is not easy) and then face an active incumbent opponent who innovates and takes actions to impede new entries. I then show that even if all firms start from a condition of equality and without any incumbency, technological competition has only one or very few winners who would consolidate as explained earlier, giving rise to the emergence of superstar firms. Such competition can be altered by a policy that prevents dominant superstar firms from expanding beyond some maximal level. This policy appears inefficient because it prevents the most productive superstar firm from expanding and taking over the market. However, the policy also prevents the large firm from impeding the growth and innovations of competing firms. Such policy to control a superstar firm increases the number of surviving firms, it increases the number of products available to consumers, it increases average productivity and, most important, *it is welfare-improving*, and therefore necessary.

To assess the history of market power of firms I measure it by the share of monopoly profits in the income of the U.S. corporate sector, for the period from 1889 to 2019. The data shows that in the First Gilded Age, late in the 19th century, and unconstrained by policy, technology and innovations increased the share of profits in corporate income to politically explosive levels while suppressing the share of capital and labor. Since the 1980s, the Information Technology revolution and the laissez-faire economic policy introduced in the 1980s, combined to usher in the Second Gilded Age that has resulted in a dramatic rise in income and wealth inequality. The share of monopoly profits in corporate income rose from 6% in the 1980s to 24% in 2019. The basic features of this Second Gilded Age, which have profoundly altered American society and its basic values, are surprisingly similar to those of the First Gilded Age.

Market power is then an outcome of a balance between innovations that increase it, and public policy that can restrain it. Absent strong antitrust policy, firms’ market power expands and enables them to earn exorbitant monopoly profits. Rising monopoly profits cause stock prices to rise, creating what I call “monopoly wealth.” Monopoly wealth equals the present value of the market expected future monopoly profits. It also equals wealth minus total capital employed as input to production, making the gap between wealth and capital into a good measure of total market power in the economy. I show that monopoly wealth has been rising since the 1980s, reaching 75% of the total value of the U.S. stock market in 2019. The leverage level of the U.S. corporate sector has also been rising, reaching 71% of total capital employed in 2019. Consequently, a useful way to look at financial markets is to view the capital stock as being financed by the bond market while the stock market becomes mostly a trading platform for monopoly wealth.

Rising profits of firms with market power increased inequality and decreased the share of labor income. I argue that the Reagan free market policy since the 1980s has abandoned effective

anti-trust activity and, together with the technological innovations of the Information Technology revolution, they are the two forces that caused the sharp rise in market power since the 1980s. Equipped with labor saving innovations, technology and policy together have caused the emergence of a large class of American workers who lost their blue collar jobs and their life-accumulated technical skills acquired by practice in manufacturing and mining. These workers have then experienced a decline of income, wealth and their health. They have not been compensated for their lost middle class incomes and feel abandoned by our democracy and by the elites who had promised them prosperity and growth when the true outcome has been poverty and bad health. This ever-rising gap within American society is the essential source of rising populism and growing social division in America, becoming a major threat to American democracy.

I devote one chapter to tell the story of electricity as a case study of innovations. By 1904 all technical, political and organizational problems of introducing electricity were solved, yet electrification of the U.S. proceeded very slowly and was not really completed before 1929. The slow pace of diffusion has been observed for most other innovations as well, and much research has been done to try and explain it; a study of GE is then research with wider implications. My study shows that a decisive cause of the slow diffusion of electricity was the monopoly power of the combination of GE and Westinghouse who signed a patent sharing agreement in 1896 and controlled the market for electric equipment. They kept the price of electricity so high that it was not profitable for firms to use it and instead, continued to use steam engines for their power needs.

Chapters 8-10 contain extensive proposals for changes in economic policy in order to combat the problems discussed here. These chapters show that current antitrust policy based on the Sherman Antitrust Act is the wrong tool to restrain technological market power, and they explain how the law must be broadened to address it. These chapters also offer detailed proposals for the reform of patent law, reform of labor law in order to improve the balance of power in the labor market, reform corporate income tax by imposing it only on monopoly profits and use individual income tax to attain a more egalitarian income distribution. I also propose to create a National Fund for Equity and Democracy in order to promote upward income and wealth mobility and stabilize the middle class. This can be accomplished by improving the education and health of children of households in the lower 50% of the income distribution.

The essential policy conclusion of the book is that democracy cannot survive if it allows technology to cause the high concentration of economic power in the hands of a few firms that earn massive profits and whose ownership is so highly concentrated that, over time, personal inequality rises to a politically unacceptable level. To encourage innovations we need to compensate innovators but confine their gains to a level compatible with the degree of market power allowed by patent law but not allow it to expand beyond that level. Therefore, for capitalism to be compatible with democracy, society needs strong government policy that prevents expansion of its market power while enabling sufficient rewards to innovators.