

Mergers and Acquisitions and Top Income Shares

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Abstract

Progressive era thinkers worried that large corporate mergers and acquisitions were primarily undertaken to enrich business managers and bankers, and that claims about increasing returns to scale or greater efficiency were largely a pretext for avoiding public scrutiny. This article assesses whether that basic hypothesis has any validity in the present era of diminished antitrust enforcement, which began around 1981. In theory, large mergers are lucrative opportunities for the corporate lawyers and investment bankers who facilitate such deals, but they are also a mechanism for displacing management and, it follows, renegotiating executive compensation. Using two separate sources of data on mergers and acquisitions involving U.S. companies, I construct an annual measure of large merger activity relative to total income for every year from 1948 to 2015, and show that the years 1981-1982 marked a turning point in the relationship between mergers and acquisitions and income inequality. A simple first-differences model is specified to describe the relationship between various forms of income inequality and relative merger activity. Estimations of that model suggest that changes in relative merger activity, from 1982 to the present, are significantly associated with changes in top 1 percent income shares and explain approximately 29 percent of the overall increase in fiscal income inequality observed over the period.

1 Introduction

For those who lived through the first Gilded Age, one of the most salient facts about American society was the astonishing growth of business enterprises, so much so that the period's name naturally conjures images of infamous "trusts" (like Standard Oil) and the corporate magnates (like John D. Rockefeller) responsible for their meteoric rise. Progressive era thinkers like Louis Brandeis responded to this trend with a surprising array of arguments as to why increasing industrial concentration was hurting the American political economy. Brandeis and others argued, for example, that the managers of these massive enterprises abused their power in the marketplace and exerted undue influence on government officials. Broadly construed, these kinds of arguments remain at the center of prominent political studies (Gilens 2012; Baker and Salop 2015).

But there was much more about the waves of business consolidation that concerned progressives like Brandeis, including the fact that the purported justification for pursuing mergers—increased manufacturing efficiency and productivity—lacked any empirical support. Having used new accounting methods to show that many such acquisitions actually undermine business profitability, Brandeis came to suspect that corporate managers and bankers engaged in these transactions regardless of their impact on firm performance because mergers were a way for financial institutions (the "money trust," in Brandeis' terms) to extract

larger shares of corporate revenue as profits (Strum 1989). Some historical scholars have echoed these concerns. Kolko (1963 at Chs.1-2), for example, contends that companies pursued mergers during the Gilded Age not only to reduce competition but also to enrich managers and bankers as evidenced by the significant overcapitalization of merged entities (see also Kaufman et al. 1990 at 62-63).

These kinds of contentions largely motivate the inquiry that follows. Whether mergers and acquisitions (M&A) benefit the businesses that engage in them and whether mergers have increased industrial concentration in recent decades are questions richly pursued elsewhere (Andrade et al. 2001; White 2002; Blonigen and Pierce 2016; Grullon et al. 2017). In the analysis below, mergers are conceptualized not as vehicles for obtaining market power or increasing firm performance but as transactions that create opportunities for certain classes of people to profit enormously. Those classes of people are the law firm partners, investment bankers, and corporate managers who play a central role in consummating mergers, people who tend to reside quite comfortably within the top 1 percent of the fiscal income distribution in the United States. Using data on top income shares from the World Wealth and Income Database and a newly constructed data set on merger activity, I show that the annual volume of large merger activity is positively associated with significant increases in income inequality, and that the effect is confined to the period starting with the presidency of Ronald Reagan when concern about mergers among antitrust officials substantially declined.

Figure 1 previews the empirical observation that lies at the heart of this study. Panel A shows a basic time series of relative merger activity, which is the logarithm of the dollar value of all M&A transactions above a certain threshold divided by GDP. The blue points represent measurements from 1948 to 1980 and the red points represent measurements from 1981 to 2015. The well-documented “waves” of merger activity are discernible, even though the underlying data focuses only on large transactions. The horizontal line drawn at zero represents the point at which the dollar value of large merger activity would be equal to that year’s gross domestic product. Before 1981, large merger activity was always less than total output, while from 1981 to 2015, large merger activity almost always exceeded total output, often by large multiples: a value of 1 represents an amount of large merger activity about 2.7 times larger than output, while a value of 2 represents an amount of large merger activity about 7.4 times larger than output. The peak value of 2.6 occurs in year 2000, a year in which the total value of large merger activity was about 13.5 times larger than total output. Overall, Panel A shows that since 1981, staggering amounts of investment have been dedicated to the purchase of extremely large businesses.

The remaining panels, B through D, illustrate the relationship between relative merger activity and various forms of income inequality. Panel B documents the relationship between relative merger activity and the top 1 percent’s share of total fiscal income (which includes both labor and capital income), while Panels C and D show the relationship between relative merger activity and the top 1 percent’s share of the labor and capital components of pre-tax national income, respectively. For each panel, the line of best fit corresponding with the data from each time period, 1948-1980 and 1981-2015, is also shown. Together, the panels suggest that M&A activity became a significant source of rising fiscal income inequality after 1981, as evidenced by the change in slope of the line of best fit between the two time periods. The data also suggests that relative merger activity is much more significantly associated with labor income inequality than capital

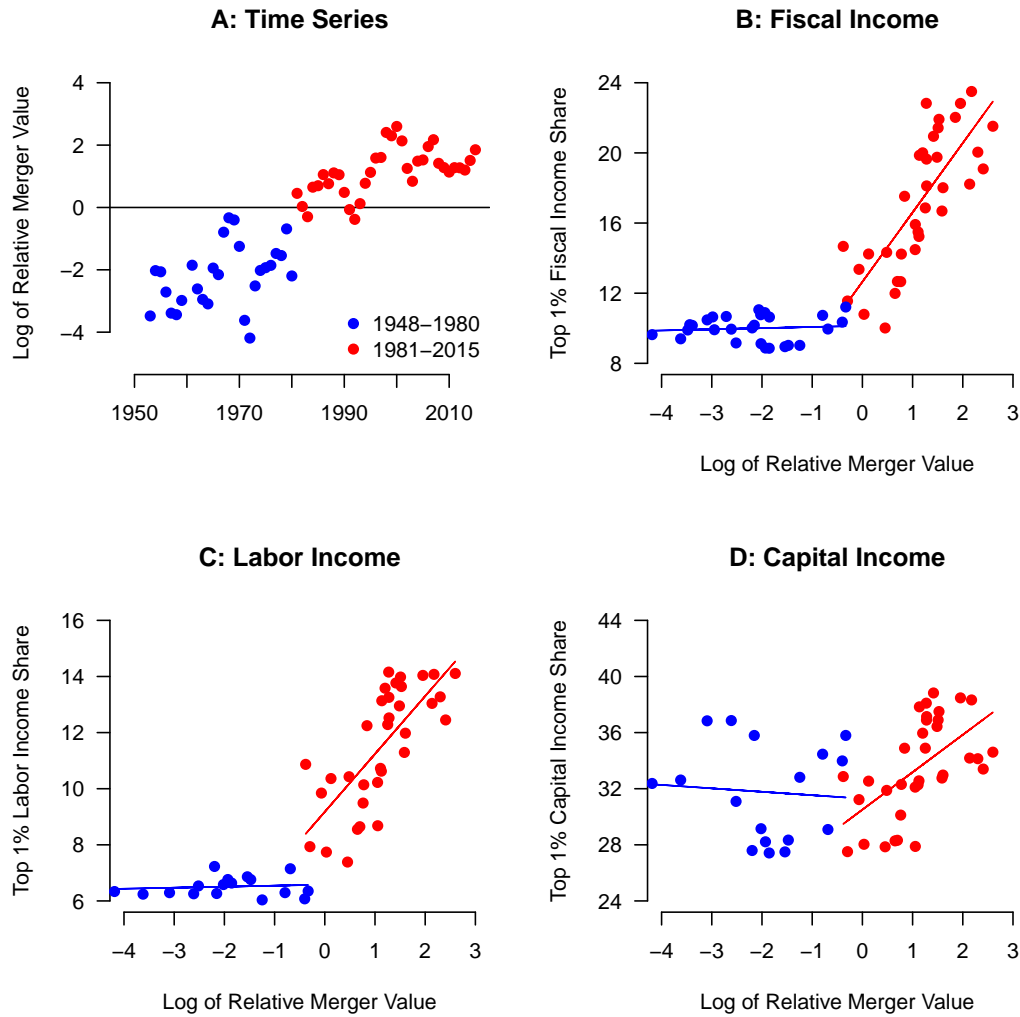


Figure 1: Panel A shows the annual level of relative merger activity from 1948 to 2015. Relative merger activity is defined as the annual dollar value of all mergers and acquisitions involving U.S. firms where the acquired assets were valued at more than \$100 million in 1950 dollars divided by annual GDP. No transactions exceeded the cutoff value from 1948 to 1952. Panels B, C, and D show the relationship between relative merger activity and the top 1 percent share of fiscal income, and the top 1 percent share of the labor and capital components of pre-tax national income. Blue points represent data from 1980 or before, while red dots represent data from 1981-2015. Lines of the same color are constructed from the slope and intercept coefficients obtained by performing OLS regressions of income share on relative merger activity in each time period. The time series must be differenced and tested for stationarity before statistical inference, and so the results of these regressions are not reported. The lines are drawn for illustrative purposes only. In panels C and D, 1962 and not 1948 is the year of the first observation because top 1 percent shares of labor and capital income are not available prior to 1962.

income inequality. As a result, rising levels of M&A activity might not appreciably increase capital gains and dividends amongst top capital income earners, but it appears to significantly increase wages (including stock

options) among the wealthiest wage earners. The empirical analysis below tests these basic relationships according to an explicit theoretical model.

In addition to the growing literature on income inequality and its political origins (Hacker and Pierson 2010; Piketty 2014; Baker and Salop 2015; Saez and Zucman 2016), the analysis that follows draws from and attempts to contribute to four main bodies of literature. The first is a growing body of economic analysis about the causes and consequences of merger activity, studies which also describe and weigh the relative merits of different sources of merger data (Nelson 1956; Lamoreaux 1985; Golbe and White 1988; Blonigen and Pierce 2016; Grullon et al. 2017; Barkai). So far as I know, these economists have not yet focused on top income shares—as opposed to the overall labor or capital share of income—as the dependent variable of interest. The second is a body of sociological analysis concerned with increasing financialization in the American economy since the late 1970s, especially those articles dealing with the ideological shifts that justified the development of a corporate “takeover market” in the 1980s (Davis and Stout 1992; Davis and Thompson 1994; Lazonick and O’Sullivan 2000; Fligstein and Shin 2007). These studies have been especially helpful for developing plausible causal mechanisms that connect merger activity with increasing inequality. The third is a law review literature concerned with shifts in antitrust policy beginning in the late 1970s and the broader implications of competition policy on economic structure (Hovenkamp 1985; Kovacic 1989; Kovacic 1990). The fourth is a handful of political studies that have evaluated changes in antitrust agency decisionmaking, especially those studies that have empirically assessed the precise timing of the dramatic shift in agency priorities commonly associated with the Reagan presidency (Eisner and Meier 1990; Wood and Anderson 1993; see also Lewis-Beck 1979).

Section 2 reviews the development of antitrust policy from 1950 to 2015, and attempts to establish that the early years of the Reagan presidency mark a critical juncture in the government’s approach towards mergers and acquisitions. Section 3 briefly theorizes as to how an increasing amount of larger mergers and acquisitions might exacerbate income inequality and specifies a model for testing that relationship. Section 4 describes the construction of a new data set on large merger activity covering the sixty-five year period at issue, and the sources of data for the remaining variables of interest. Section 5 uses ordinary least squares (OLS) regression analysis to establish a positive and statistically significant association between changes in relative merger activity and changes in various forms of income inequality. Section 6 concludes with thoughts on the broader implications of these findings and possible avenues for future research.

2 Economic Ideology and Antitrust Enforcement from 1950 to 2015

Congress erected the three foundational pieces of federal antitrust law before the first World War and the law has remained relatively unchanged since then, though the system as a whole leaves a substantial amount of discretion with enforcement agencies and has always been somewhat dependent on prevailing attitudes at the Supreme Court. With respect to mergers and acquisitions, the Sherman Act of 1890 prohibited all contracts, combinations, and conspiracies in restraint of commerce or trade (section 1) along with monopolization or attempts to monopolize any part of trade or commerce (section 2). The Clayton Act of 1914 empowered

antitrust agencies to challenge such conduct in its “incipiency” by prohibiting mergers that “may” lessen competition or “tend” to create monopoly (section 7). And the Federal Trade Commission Act of 1914 created a new agency, alongside the Department of Justice (DOJ), to define and investigate the acts that amount to “unfair competition.” Though Congress did occasionally revise the statutory framework in subsequent years,¹ none of the changes significantly altered the overall legislative framework.

None of these major enactments had substantial impact at first, as a conservative Supreme Court generally interpreted the laws in ways that were deferential to business and even used the laws to stifle the growth of labor unions (Purcell 2000). But starting around 1937, antitrust enforcement entered a period of maturation. In 1935, the Supreme Court unanimously held the National Industrial Recovery Act unconstitutional, thus ending President Roosevelt’s flirtation with corporatist approaches to economic recovery (Hovenkamp 1985; Hawley 1995). A new group of policymakers who believed that oligopoly and economic concentration were exacerbating the Depression subsequently acquired more influence in the executive branch, and the appointment of one such official (Robert Jackson) as Assistant Attorney General for Antitrust in 1937 started a wave of anti-monopolization litigation that continued well into the 1950s (Kovacic 1989). Around the same time, the conservative resistance to progressive legislation at the Supreme Court substantially lessened (*West Coast Hotel Co. v. Parrish*, 300 U.S. 379 (1937); *Erie Railroad Co. v. Tompkins*, 304 U.S. 64 (1938)).

Federal merger policy from 1950 to the present can be roughly decomposed into two major periods: one from about 1950 to 1980 characterized by skepticism of mergers and a willingness to intervene to maintain a competitive market structure, and another from 1981 to the present characterized by a skepticism of government intervention and a willingness to let all but the most objectionable transactions proceed. The first period is in some sense a continuation or escalation of the New Deal approach to mergers and acquisitions. Many scholars and policymakers began arguing in the late 1950s that the government was still not doing enough to prevent business consolidations and pushed for substantial reform and stronger antitrust enforcement (Kovacic 1989). Influential Harvard economist Joe Bain argued, for example, that scale economies in most industries were not substantial while barriers to entry were high and amenable to manipulation, so antitrust officials needed to dedicate more resources to divestiture in oligopolistic markets. These arguments influenced federal policy: in 1968, the DOJ promulgated a new set of merger guidelines based substantially on those same premises (Hovenkamp 1985). The Supreme Court also seemed to embrace some of these basic tenets. The Court’s 1962 decision in *Brown Shoe Co., Inc. v. United States* (370 U.S. 294), for example, is often interpreted as expressing the Warren Court’s approval of DOJ intervention in mergers that have any potential to reduce competition.

By the middle of the 1970s, an intellectual counter-movement was emerging that challenged the reigning consensus about antitrust enforcement priorities, a movement that has deeply influenced antitrust policymaking to the present day (Hovenkamp 1985; Kovacic 1990; Eisner and Meier 1990; Wood and Anderson 1993). This conservative critique, often associated with the Chicago School of Economics, differed from

¹The Celler-Kefauver Act of 1950 closed a loophole in the Clayton Act by adding asset purchases (as opposed to stock purchases) above the relevant thresholds to the list of prohibited conduct. The Hart-Scott-Rodino Antitrust Improvements Act of 1976 required companies to notify the FTC and DOJ of all potential mergers, according to certain asset and price thresholds, and prohibited companies from completing those mergers until after a waiting period had passed so that the agencies had time to evaluate the potential anti-competitive effects and take necessary action.

prior orthodoxy in many respects, but especially when it came to mergers and acquisitions. Leading scholars argued that oligopolistic markets were much more competitive than previously assumed and that monopolized markets often “self-correct” in the absence of government intervention (Baumol and Ordover 1985; Hovenkamp 1985). Some financial economists also began arguing that mergers were an important way of disciplining corporate executives who pursued business strategies other than maximizing shareholder value and were therefore a much needed part of the overall business environment (Davis and Stout 1992; Lazonick and O’Sullivan 2000). The Burger Court seemed to embrace this new thinking to some degree: the Court’s 1974 decision in *United States v. General Dynamics Corp.* (415 U.S. 486) is often seen as a partial withdrawal from *Brown Shoe* (Hovenkamp 1985). But while this shift in economic thinking about mergers has visible roots in the 1970s, it gained significant momentum with the presidency of Ronald Reagan, his appointment of James Miller III as chairman of the FTC in 1981, his appointment of William Baxter to lead the Antitrust Division of the DOJ in 1981, and the DOJ’s promulgation of new merger guidelines based on the conservative critique in 1982 and 1984.

Determining whether the transition between these two periods of antitrust policy was slow and secular or dramatic and discontinuous is a difficult endeavor but important for the analysis below. The model used herein presumes that a discontinuity in merger policy starting around 1981 caused the relationship between M&A activity and income inequality to change from being insignificant before 1981 to being positive and significant after 1981, an assumption that needs to be justified with data on antitrust agency actions.

Generally, data which shows antitrust agency priorities relative to total agency activity suggests a secular decline, while data which shows antitrust agency priorities relative to economic activity suggests a much more dramatic shift. For example, Panel A in Figure 2 shows the percentage of total DOJ antitrust cases filed each year against companies in the Fortune 500, while Panel B shows the percentage of total DOJ antitrust cases involving mergers or monopolization as opposed to other types of anticompetitive conduct from 1955 to 1997. The figures suggest a secular (albeit substantial) decline in relative levels of DOJ lawsuits against exceptionally large companies and lawsuits challenging mergers and acquisitions regardless of company size, with the decline starting around the early 1970s and continuing into the early 1990s, perhaps rebounding a bit in the mid 1990s.

In contrast, Panel C in Figure 2 shows the percentage of proposed mergers reported to the FTC or the DOJ under the Hart-Scott-Rodino Antitrust Improvements Act of 1976 where either agency took the step of requesting more information from the merging entities before approving or challenging the transaction. This data is only available starting in September of 1978, but it demonstrates a precipitous decline in this rather cursory form of scrutiny² between 1979 and 1982, from more than 12 percent to about 4 percent of all proposed transactions. Antitrust officials were aware of and sensitive to this shift. In public reports, President Reagan’s appointee, James Miller III, argued that the trend reflected a learning process where businesses submitted fewer objectionable proposals while commissioner Michael Pertschuk disputed Miller’s “Panglossian” view and argued that the shift reflected a clear change in administrative priorities (HSR Reports for 1982 and 1983).

²Small percentages of proposed cases subject to such a request actually get challenged.

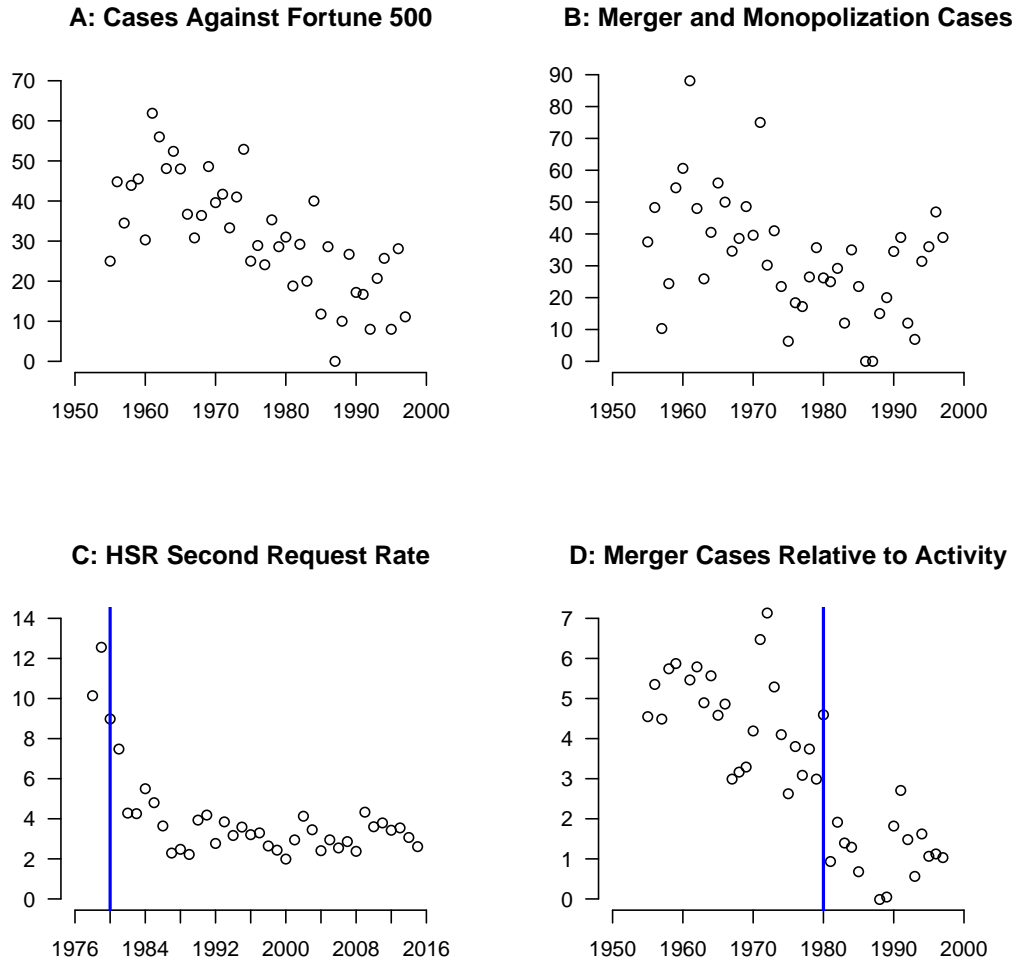


Figure 2: Panels A and B respectively show the annual percentage of DOJ antitrust cases brought against Fortune 500 companies from 1955 to 1997 and the annual percentage of DOJ antitrust cases alleging monopolization or challenging a merger from 1955 to 1997. *Source:* Gallo et al. (2000). Panel C shows the percentage of proposed mergers where the FTC or the DOJ issued a request for more information before allowing the deal to proceed or initiating a challenge (formally, a “second request”). *Source:* Federal Trade Commission Annual Reports to Congress Pursuant to Section 201 of the Hart-Scott-Rodino Antitrust Improvements Act of 1976. Panel D shows the logarithm of the total number of DOJ cases alleging monopolization or challenging a merger divided by relative merger activity from 1955 to 1997. *Source:* Gallo et al. (2000). The vertical blue lines in Panels C and D are drawn to suggest a significant shift in agency priorities starting around 1980.

Similarly, Panel D in Figure 2 shows the logarithm of the total number of DOJ merger and monopolization cases divided by relative merger activity. One way of interpreting Panel D is to assume that the total annual dollar value of big mergers and acquisitions (deals valued at more than \$100 million in inflation

adjusted 1950 dollars) is equal to that year's GDP. Under that assumption, Panel D shows the logarithm of the number of merger and monopolization cases filed in each year holding relative merger activity constant. As with some of the other data, there is evidence of a secular decline in this measure of relative merger litigation prior to 1980, but the decline rapidly accelerated after 1980 and in fact, the change between 1980 and 1981 is about 3.66 on the log scale, or an almost 40-fold decline in enforcement levels.

Taken together, the data suggests that the critical juncture around 1981 reflects a continuous decline in antitrust scrutiny of mergers in the midst of an explosion in merger activity, so that comparisons of agency activity to prior years—instead of to economic activity—can be somewhat misleading. The percentage of DOJ cases challenging mergers and acquisitions may have declined in the early 1980s at rates comparable to the 1970s, but that took place amidst an explosion in merger activity so that the relationship of regulatory activity to the amount of economic activity meriting regulatory scrutiny is discontinuous. Given this critical change in antitrust policy, the question raised is: did the profits extracted through rising volumes of large transactions flow predominately to the wealthiest Americans?

3 Theory

Theoretically, large mergers and transactions create a number of opportunities for top earners to increase their share of income from labor. Large deals are often quite complex, and the attorneys for both corporate entities often need to perform a significant amount of due diligence. Similarly, the investment bankers involved frequently need to employ more complex models to accurately determine the fair market value for each entity and may need to put more work into issuing the equity or raising the debt needed to consummate the deal.

According to the World Wealth and Income Database, the threshold income for the 99th percentile in the United States in 2014 (based on pre-tax factor income) was about \$445,000 in constant 2016 dollars. Only the most senior associate attorneys would likely meet this threshold income. A seventh-year associate at a large law firm can easily earn a salary of about \$300,000 per year today, but it would take a fairly generous bonus (by law firm standards) for an associate at that level to make it into the top percentile of the income distribution. Many law firm partners, however, easily fall within the top percentile. Average compensation for law firm partners was about \$718,000 per year in 2014.³ Holding all else equal, if either the number of large deals or the size and complexity of a given number of deals increases, total law firm profits from M&A activity should also increase, as should per partner income.

Investment banker salaries for associates are generally much lower than associate attorney salaries, though bonuses often make up a much larger portion of their overall compensation. Some fourth-year associates at firms that pay above market could conceivably make it into the top percentile in years with high numbers of large transactions.⁴ More senior directors and partners will quite often fall within the top percentile in

³See Major, Lindsey, & Africa survey results summarized at <https://www.mlaglobal.com/news/new-study-shows-gains-in-compensation-for-law-firm-partners>.

⁴See Phaidon International survey results summarized at <http://news.efinancialcareers.com/us-en/237433/associate-pay-banking/>.

even bad years. Investment banks are generally compensated based on a commission calculated as a percentage of the transaction size, and so as the size of mergers and acquisitions increases, compensation for both non-equity directors (with bonuses tied to performance) and equity partners (with compensation tied to firm profits) should increase. Increased compensation to financial sector workers may explain about 15-25 percent of the overall increase in wage inequality since 1980 (Philippon and Reshef 1980), and the rising volume and complexity of large mergers since 1980 may be one channel through which financial sector pay has increased.

Mergers and acquisitions are pursued for a variety of business reasons but, as suggested above, one of the primary justifications for relaxing antitrust scrutiny of mergers and acquisitions around 1981 was to create a “takeover market” to oust executives who do not meet shareholder expectations. Deals undertaken for this purpose necessarily create opportunities to renegotiate executive compensation, and while it is possible that compensation could be adjusted downward, that outcome is not likely for two reasons. First, only large firms can reasonably finance large acquisitions and such acquisitions typically increases the merged firm’s size in the short run (at least when measured by assets), even if the overarching goal is divestiture. Since executive compensation appears to be correlated with firm size (see Gabaix et al. 2013), executives considered for new management are likely to fall within the top percentile of the income distribution and can expect increased compensation after the merger is completed. Also, executives may have simply become better at extracting firm profits for personal gain since the 1970s (Bebchuck and Fried 2004), an entirely plausible development given that the explicit purpose of many acquisitions is to disgorge corporate profits. Changes in federal regulation of executive compensation after 1980 may have contributed to this process (Davis and Thompson 1994 at 166; Wallace and Ferris 2006; Hacker and Pierson 2010 at 185-192; Lazonick and Mazzucato 2013 at 1115-17).

Each of these mechanisms is a plausible channel through which those who reside within the top of the labor income distribution in any given year might further increase their share of labor income, though we will not be able to distinguish which if any channel predominates using aggregate data on top income shares and merger activity. The analysis conducted below is structured in a way that allows us to determine how one type of economic activity—large mergers and acquisitions—increases income inequality in the aggregate through all of these plausible channels.

Theoretically, mergers and acquisitions could also exacerbate capital income inequality. Many mergers are undertaken with the intent of increasing the overall market valuation of the merging companies, and many takeovers are undertaken with the intent of divesting firms that have grown too large under the belief that the market value of the component parts will exceed that of the consolidated entity. If mergers and acquisitions do actually increase shareholder value, and if the top percentile of the capital income distribution disproportionately benefit from that increase in stock market value, then M&A activity might also exacerbate capital income inequality.

Based on these considerations, I specify a model for the relationship between income inequality and merger activity as follows. First, I assume that the amount of income earned by the top 1 percent of a

given income distribution (fiscal, labor, or capital) in year t , represented by i_t , depends on the nominal value of M&A activity above a given cutoff in year t , represented by M_t . If those in the top 1 percent earn a time-constant percentage of total M&A activity, this relationship could be modeled as:

$$i_t = \beta_0 + \beta_1 t + \beta_2 \log(M_t) + \mu_t \quad (1)$$

where the β_1 coefficient captures the slope of any exogenous time trend and the logarithm of M_t captures the concept of diminishing marginal returns.⁵

Second, since income inequality and not income levels are the primary concern, I divide both variables of interest, i_t and M_t , by total income (fiscal, labor, or capital), I_t , so that the relationship of interest becomes:

$$Is_t = \frac{i_t}{I_t} = \beta_0 + \beta_1 t + \beta_2 \log\left(\frac{M_t}{I_t}\right) + \mu_t \quad (2)$$

In this specification, Is_t is the top 1 percent income share in year t , which is represented below as Fs_t for the fiscal income distribution, Ls_t for the labor component of the pre-tax national income distribution, and Ks_t for the capital component of the pre-tax national income distribution. The coefficient, β_2 , captures the relationship between top income shares and merger activity relative to different measures of total income.

Next, I take the first difference of this specification to eliminate any exogenous time trends and allow the difference in $\log\left(\frac{M_t}{I_t}\right)$ to interact with a dummy variable, D_t , representing the policy interventions associated with the start of the Reagan presidency. The final specification then becomes:

$$\Delta Is_t = \beta_1 + \beta_2 \Delta \log\left(\frac{M_t}{I_t}\right) + \beta_3 D_t + \beta_4 \Delta \log\left(\frac{M_t}{I_t}\right) \times D_t + \epsilon_t \quad (3)$$

where Δ indicates differencing between time periods (i.e. $\Delta Is_t = Is_t - Is_{t-1}$) and the residuals, ϵ_t , are equal to $\Delta \mu_t$.

When differenced, the main independent variable of interest has the qualities of an elasticity, because:

$$\log\left(\frac{M_t}{I_t}\right) - \log\left(\frac{M_{t-1}}{I_{t-1}}\right) = \log\left(\frac{M_t/M_{t-1}}{I_t/I_{t-1}}\right). \quad (4)$$

Thus, the model effectively estimates the relationship between changes in top income shares and the extent to which the rate of growth in merger activity exceeds the rate of income growth. The model specified in equation 3 can be estimated with OLS regression given data on top 1 percent income shares and levels, provided by the World Wealth and Income Database, and annual merger activity.

The basic model in equation 3 controls for any time constant omitted variables but not time varying omitted variables. To address that potential problem, I developed an instrumental variables specification using the effective federal funds rate (EFFR) as the primary instrument. The EFFR is a weighted average of

⁵In the same way that the U.S. tax system increases the marginal tax rate as income increases, investment banks are known to step down their proposed commission percentage as the final acquisition price exceeds certain thresholds. Lawyer and executive compensation should also behave similarly, albeit for different reasons.

the interest rates at which banks lend surplus reserve balances to one another overnight, but it is influenced by the Federal Open Market Committee's (FOMC) attempts to align the rate with a periodically adjusted target rate.

Changes in the EFFR alone have no discernible direct relationship with changes in top income shares (regressions of ΔF_{s_t} , ΔL_{s_t} , and ΔK_{s_t} on changes in the EFFR do not have significant coefficients), but they are tightly correlated with changes in relative merger activity. As a result, changes in the EFFR most likely exacerbate income inequality only through their effect on some intervening variable, and the exclusion restriction in this case requires that changes in the EFFR influence income inequality solely by promoting or inhibiting relative merger activity. It is hard to imagine a class of financial transactions comparable in size to mergers and acquisitions that might frustrate this assumption. Annual investment in residential housing, for example, should be influenced by interest rates and housing purchases might be one channel by which top earners increase their share of total wealth or capital income. But according to the National Association of Home Builders, annual investment in residential housing amounts to only 3-5 percent of GDP,⁶ a trifling amount compared to total investment in mergers and acquisitions since 1980.

I initially selected the EFFR as an instrument because it is exogenously changed by the FOMC and because I hypothesized that interest rate increases would suppress relative merger activity on balance (i.e. the relationship would be negative). In fact, the relationship between the EFFR and relative merger activity is positive. This most likely reflects the fact that when the EFFR is increased, it not only increases the base interest rate at which investment banks will be willing to finance new transactions, it also increases the debt burden of those companies who need to service existing debt with floating interest rates. Companies that find themselves financially constrained because of interest rate increases should be more willing to merge to avoid liquidation. As a result, there are at least two forces at work: an increase in the EFFR suppresses the supply of debt financing, but it also increases the number of potential targets and decreases those targets' leverage in negotiating a sale price. The overall effect will depend on which channel prevails, and it appears that the latter channel tends to dominate.

Using changes in the average annual EFFR, ΔF_t , as an instrument for $\Delta \log(\frac{M_t}{I_t})$ with no other controls, the basic first stage relationships for each endogenous variable can be modeled as follows:

$$\Delta \log\left(\frac{M_t}{I_t}\right) = \gamma_0 + \gamma_1 \Delta F_t + \gamma_2 D_t + \gamma_3 \Delta F_t \times D_t \quad (5)$$

$$\Delta \log\left(\frac{M_t}{I_t}\right) \times D_t = \sigma_0 + \sigma_1 \Delta F_t + \sigma_2 D_t + \sigma_3 \Delta F_t \times D_t. \quad (6)$$

But the extent to which changes in the EFFR influence relative merger activity likely depends on other macroeconomic variables. Large mergers and acquisitions are generally financed in one of three ways: (1) through an equity swap, where firms trade shares in their respective companies; (2) through cash or retained earnings; or (3) through the issuance of new debt. Equity swaps become riskier as the size of the transaction

⁶Based on data from the Bureau of Economic Analysis, summarized at: <https://www.nahb.org/en/research/housing-economics/housings-economic-impact/housings-contribution-to-gross-domestic-product-gdp.aspx>.

increases and as the stock market becomes more volatile. As a result, if stock market volatility, S_t , is increasing, merging companies may find equity swaps less attractive and interest rates may play a more significant role in financing M&A. The ability to finance large transactions through cash will depend, of course, on the aggregate level of corporate cash relative to income, C_t/I_t . Similarly, at a given interest rate, the ability of banks to offer debt financing will be constrained by the overall level of existing corporate debt relative to income, B_t/I_t . The relationship between relative merger activity and the EFR can therefore be modeled as follows:

$$\Delta \log\left(\frac{M_t}{I_t}\right) = \gamma_0 + \gamma_1 \Delta F_t + \gamma_2 \Delta S_{t-1} + \gamma_3 \Delta \log\left(\frac{C_{t-1}}{I_{t-1}}\right) + \gamma_4 \Delta \log\left(\frac{B_{t-1}}{I_{t-1}}\right) \quad (7)$$

where decisions in period t are based on stock market volatility and relative cash and debt levels in period $(t - 1)$ to avoid a simultaneity problem. The first stage equations can be derived from this relationship by simply adding the exogenous policy intervention, D_t , and its interaction with the dependent and independent variables as in equations 5-6.

4 Data

Individual mergers and acquisitions are pursued for many reasons, but across the economy, aggregate measurements of M&A activity can be thought of as the total amount of investment devoted to purchases of *existing* assets in lieu of investing in the purchase or creation of *new* assets (Golbe and White 1988). Historical sources of aggregate M&A activity offer various strengths and benefits, though a common problem with using many such sources is that they report the number of transactions above a nominal price threshold (not adjusted for inflation) and often do not report individual or aggregate transaction sizes (in dollars).

Because transactions of high value are the most likely to exacerbate income inequality, I construct an estimate of the total amount of large M&A activity by merging two data sets: (1) a series published by the Federal Trade Commission that reports the dollar value of acquired assets for all companies in the mining and manufacturing sector that were acquired by another company between 1948 and 1978 and had assets in excess of \$100 million (nominal); (2) data taken from the SDC Platinum database on all completed mergers and acquisitions of domestic companies between 1979 and 2015 where the acquiring company owned more than 50 percent of the target company after the transaction, and where the value of the transaction was estimated to be in excess of \$100 million (nominal). Both data sets list individual transaction sizes, so it is possible to exclude all transactions from the annual aggregate measurement that do not exceed \$100 million in 1950 dollars after adjusting for inflation using a national income price index published by the World Wealth and Income database (variable code inyixx999i). I refer to mergers above this adjusted threshold as *large* mergers throughout. To provide perspective on the sheer size of the deals included in this estimate, in 2015, the last year in the combined series, this threshold value was about \$800 million.

One concern with combining these two data sets is that they sample from different populations: firms in manufacturing and mining for the FTC series and all domestic firms in the SDC Platinum series. The fact that manufacturing and mining have historically only made up about 25-30 percent of GDP suggests that the

FTC data may underestimate overall M&A activity from 1950 to 1978. Estimates of merger activity (in 2016 dollars) in 1979 and 1980 from the SDC data (\$313 and \$333 billion) are about twice as high as the estimates for 1977 and 1978 from the FTC data (\$161 and \$117 billion), which suggests that the FTC data might underestimate aggregate activity by about a factor of two, but not an order of magnitude. This is consistent with data taken from the Statistical Abstract of the United States, which suggests that between 40.9 and 42.6 of all completed mergers and acquisitions from 1976 to 1978 involved acquired firms in manufacturing or mining (see Table 958 of the 1979 Abstract and Table 906 of the 1981 Abstract). Lacking a consistent way to adjust my measurements upward for all years from 1948 to 1978, I leave the FTC series unadjusted. I therefore assume that aggregate M&A activity in manufacturing and mining tracks or predicts overall M&A activity in this time period. The data point reflecting the bridge between the series (the difference from 1978-1979) was not excluded.

As specified in equation 3, relative merger activity is equal to the logarithm of the total annual value of acquired assets among transactions that exceed an inflation adjusted cutoff divided by the chosen measure of total income in the same year. The World Wealth and Income Database does not publish total fiscal income or pre-tax labor and capital income from the national income distribution, but it does publish average income levels (from the 0 to 100th percentile) along with the annual population and number of taxpayers. I therefore estimated total fiscal income, FI_t , by multiplying average fiscal income among all tax units (variable code `afiinc992t`) by the total number of tax returns (variable code `ntaxre999t`). Similarly, I estimated total labor and capital income, LI_t and KI_t , by multiplying the average labor and capital income for all adults from the labor and capital components of pre-tax national income distribution (variable codes `apllin992j` and `apkkin992j`) by the total adult population (variable code `npopul992j`).

Data on top 1 percent income shares is also taken from the World Wealth & Income Database. The main dependent variable of interest, Fs_t , is the top 1 percent share of fiscal income (variable code `sfiinc992t`), which includes all taxable income (labor and capital income) before any deductions. This data is readily available for 1948-2015. To try and determine whether merger activity influences income inequality by way of labor income (partnership profits, executive stock options, wages, and bonuses) or by way of capital income (capital gains or dividends from owning stock in merging companies), I also use the top 1 percent's share of labor and capital income (variable codes `spkkin992j` and `spllin992j`), Ls_t and Ks_t , from the labor and capital components of the pre-tax national income distribution, though this data is only available from 1962-2014. I use this measure because top 1 percent shares of labor and capital income based on the total fiscal income distribution are not yet available.

For the instrumental variables analysis, I utilized the annual average of monthly EFFF values published by the Federal Reserve Bank of St. Louis (F_t), and for stock market volatility (S_t), I used the annual standard deviation of daily values for the Dow Jones Industrial Average provided by Quandl. Annual measurements of corporate debt obligations (C_t) from 1948-2013 and gross corporate savings (B_t) from 1948-2014 are published by the World Wealth and Income Database (variable codes `mcwdeb999i` and `mcsgro999i`).

5 Empirical Analysis

Before estimating equation 3, Augmented Dickey-Fuller tests with a lag of one were performed on all of the differenced time series ($\Delta I s_t$ and $\Delta \log(\frac{M_t}{I_t})$ for $I = F, L, K$) against a null hypothesis that the series was stationary. In all cases, the p-values obtained from the test were lower than 0.05 (and frequently lower than 0.01), indicating that the null hypothesis of stationarity can be rejected with high degrees confidence. All reported standard errors (and the significance tests and confidence intervals based on them) are robust to heteroskedasticity and auto correlation.

In equation 3, the main coefficients of interest are β_2 and β_4 . If β_2 is *not* statistically significant, then we cannot reject the null hypothesis of no relationship between income inequality and relative merger activity prior to the policy intervention. If β_4 is statistically significant, we can reject the null hypothesis of no change in the relationship after the policy intervention. Together, these two outcomes suggest that before the intervention year, changes in the levels of mergers and acquisitions relative to the size of the economy did not appreciably benefit those within the top 1 percent of the income distribution, but after the intervention year, relative merger activity conferred concrete benefits to those individuals. Given a significant β_4 , we are also interested in knowing the size of the marginal effect in the post-intervention relationship ($\beta_2 + \beta_4$) and the 95 percent confidence intervals surrounding that estimated effect.

It is worth noting up front that the results of estimating equation 3 are highly dependent on the year chosen for the intervention, 1981 or 1982. In several respects, 1981 makes sense because it coincides with the first year of the Reagan presidency, the strong signals of fundamental changes in antitrust policy embedded in the Miller and Baxter nominations, and the visible discontinuity in relative merger activity demonstrated above. At the same time, income shares did not change significantly between 1980 and 1981 so the data for this point becomes somewhat of an outlier in the post-intervention period and substantially reduces the statistical significance of the estimated coefficients. I therefore set the intervention year at 1982 in the analysis below, while noting that the results are sensitive to this choice. In 1982, the FTC and the antitrust division of the DOJ codified their change in enforcement priorities in a new set of merger guidelines, thereby signaling that the policy would be somewhat stable if not permanent. Also in 1982, Congress and the Reagan administration lowered the marginal tax rate on the highest income bracket from 70 to 50 percent, a change which might have incentivized top earners to more aggressively pursue available avenues of income enhancement (Hacker and Pierson 2010).

Table 1 shows the coefficients and standard errors derived from estimating equation 3. For both fiscal and labor income, we cannot reject the null hypothesis of no relationship between relative merger activity and income inequality from 1953 to 1981, but the statistically significant interaction terms suggest a substantial positive relationship from 1982 to 2015. The coefficient on the interaction term is significant at the 1 percent level for fiscal income and at the 5 percent level for labor income. For capital income, we cannot reject the null hypothesis of no relationship between relative merger activity and capital income inequality in either time period. These results suggest that the changes in policies associated with increasing relative merger activity after 1982—from relaxed antitrust enforcement to financial deregulation to changes in top marginal tax codes—created lucrative opportunities for top wage earners to increase their share of total labor income,

Table 1: First Differences Analysis

	Fs	Ls	Ks
	(1)	(2)	(3)
MFI	0.171 (0.255)		
MLI		0.019 (0.111)	
MKI			0.161 (0.227)
D	0.292 (0.334)	0.111 (0.157)	0.826** (0.321)
MFI:D	1.565*** (0.582)		
MLI:D		0.469** (0.227)	
MKI:D			0.098 (0.463)
Constant	-0.014 (0.251)	0.071 (0.131)	-0.558** (0.267)
N	60	48	48
R ²	0.183	0.134	0.142
Adjusted R ²	0.140	0.074	0.084
Residual Std. Error	1.274 (df = 56)	0.501 (df = 44)	1.020 (df = 44)
F Statistic	4.188*** (df = 3; 56)	2.261* (df = 3; 44)	2.435* (df = 3; 44)

*p < .1; **p < .05; ***p < .01

Table 1: In column 1, the dependent variable is the top 1 percent share of fiscal income (Fs), while in columns 2 and 3, the dependent variables are the top 1 percent share of the labor and capital component of pre-tax national income (Ls and Ks, respectively). The independent variables MFI, MLI, and MKI are the logarithm of large merger activity divided by total fiscal, labor, and capital income, respectively. The variable D is a binary variable equal to 0 from 1948-1981 and 1 thereafter, and represents changes in antitrust policy associated with the Reagan administration. The terms joined by a colon are interaction terms between relative merger activity (MFI, MLI, or MKI) and D .

including stock options. At the same time, even if we assume that relative merger activity generates capital income in the form of capital gains or higher dividends, those gains have not flown disproportionately to the top 1 percent of the capital income distribution.

Table 2: Effect Size from First Differences Analysis

	Effect	Conf. Interval (95%)
MFI, D=0	0.171	(-0.951, 1.292)
MFI, D=1	1.735	(0.64, 2.831)
MLI, D=0	0.019	(-0.389, 0.427)
MLI, D=1	0.489	(0.083, 0.894)
MKI, D=0	0.161	(-0.544, 0.867)
MKI, D=1	0.26	(-0.177, 0.696)

Table 2: The independent variables MFI, MLI and MKI are the logarithm of large merger activity relative to total fiscal, labor, and capital income, respectively. D is a binary variable equal to 0 from 1948-1981 and 1 from 1982-2015 and represents changes in antitrust policy associated with the Reagan administration. From 1948-1981 ($D = 0$), we cannot reject the null hypothesis that relative merger activity (MFI, MLI, and MKI) had no effect on fiscal, labor, or capital income inequality (Fs, Ls, or Ks). All of the 95 percent confidence intervals associated with the estimated coefficients include 0, indicating that the estimated effect is not statistically significant at the 5 percent level. From 1982-2015 ($D = 1$), the relationship between merger activity relative to total capital income (MKI) and capital income inequality (Ks) remains insignificant, while the relationship between merger activity relative to total fiscal and labor income (MFI and MLI) and fiscal and labor income inequality (Fs and Ls) becomes positive and significant at the 5 percent level.

Table 2 shows the effect of a one unit change in relative merger activity on the chosen measure of income inequality and 95 percent confidence intervals surrounding those estimates in the pre-1982 ($D = 0$) and post-1982 ($D = 1$) time frames. The estimated effect sizes suggest that a one unit change in relative merger activity after 1982 is associated with a 1.735 percentage point increase in the top 1 percent's share of fiscal income and a 0.489 percentage point increase in the top 1 percent's share of labor income. Given that the log of merger activity relative to total fiscal income increased by 1.88 units from 1982 to 2015, relative merger activity explains about 29.1 percent of the 11.2 percentage point increase in fiscal income inequality over this time period ($29.1 = 100 \times 1.88 \times 1.735/11.2$). Given that the log of merger activity relative to the labor component of pre-tax national income increased by 1.59 units from 1982 to 2015, relative merger activity explains about 12.4 percent of the 6.24 percentage point increase in labor income inequality over this time period ($12.4 = 100 \times 1.59 \times 0.489/6.24$).

Figure 3 illustrates the relationships between changes in income inequality and changes in relative merger activity based on these estimates (Panels B-D), and also provides the time series of changes in merger activity relative to fiscal income for comparison (Panel A). The time series shows that relative merger activity had a higher variance prior to 1982, even if average amounts of merger activity were quite low relative to income. The remaining panels graphically illustrate the numerical results described above. From 1954 to 1981, the relationship between changes in relative merger activity and changes in various measures of income inequality are statistically indistinguishable from zero, as represented by the relatively flat blue lines. From 1982 to 2015, the relationship between large merger activity relative to total capital income remains insignificant

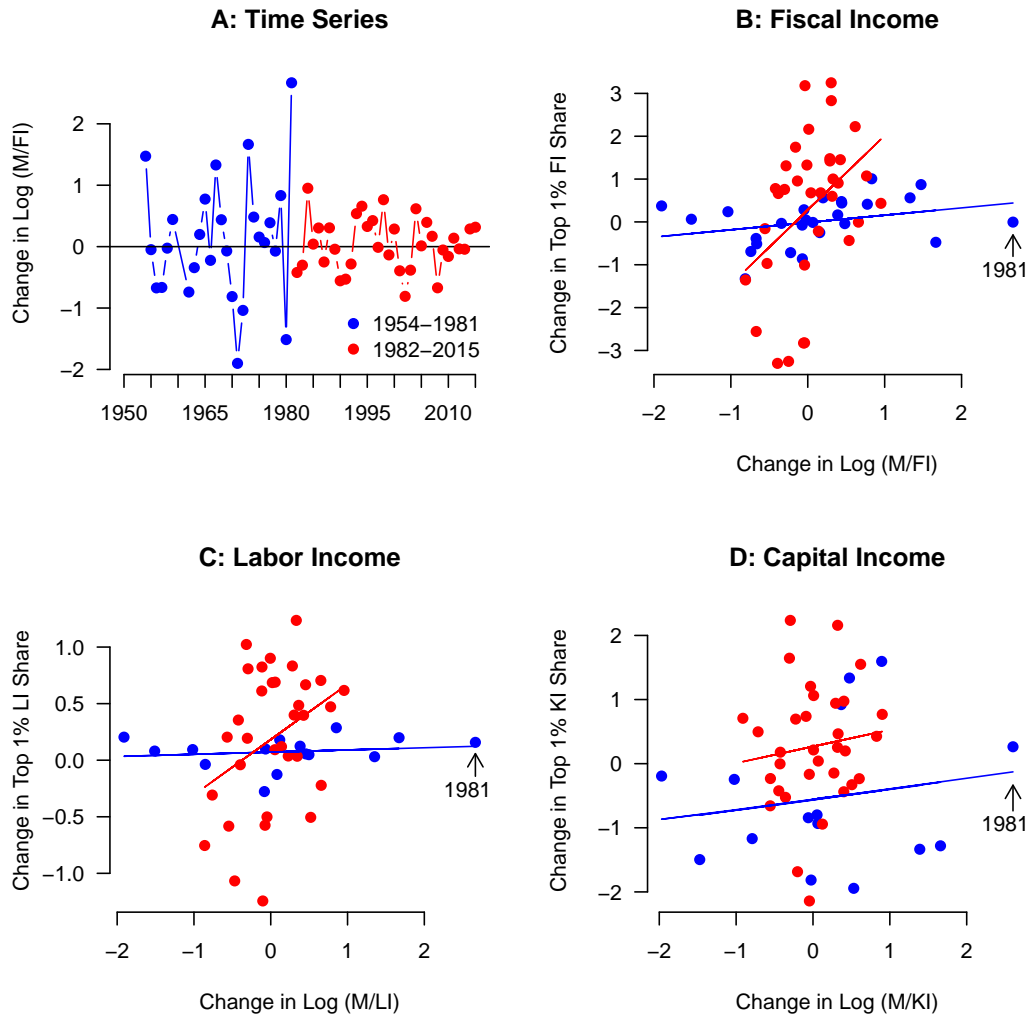


Figure 3: Panel A shows changes in the log of merger activity relative to fiscal income (MFI) from 1954 to 2015. Panels B, C, and D show the relationship between relative merger activity (MFI, MLI, and MKI) and the top 1 percent's share of fiscal, labor, and capital income (Fs, Ls, and Ks). Blue points represent data from 1981 or before, while red dots represent data from 1982 to 2015. Arrows point to data for the change between 1980-1981, which diminishes the significance of the results if included in the post-intervention time period. The change in slope in Panels B and C reflects a statistically significant change in the relationship between relative merger activity and labor and fiscal income.

(Panel D), but the relationship between large merger activity relative to fiscal and labor income (Panels B and C) becomes positive and significant as represented by the positive slope of the red lines.

The instrumental variables analysis generally produced coefficients of comparable size to the estimates from the first differences model, though less precisely estimated. To estimate these models, I used the `ivreg2` command in Stata (Baum et al. 2010) using options for small sample test statistics and standard

errors robust to heteroskedasticity and auto correlation. The estimates of equations 5-6 for fiscal income, for example, produced a coefficient of 2.01 on the interaction of $\log(\frac{M_t}{F_t})$ with D_t (instead of 1.735) but with a 95 percent confidence interval of (-0.69, 4.71). The effective federal funds rate also has a weaker relationship with relative merger activity prior to 1982 than after, and the Sanderson-Windmeijer F-test of excluded instruments (3.94) for $\log(\frac{M_t}{F_t})$ suggests that the model suffers from weak identification. Also, an endogeneity test could not reject the null hypothesis that the endogenous variables are actually exogenous (p-value of 0.876). Adding exogenous co-variates according to equation 7 resolved the weak identification problem but not the endogeneity problem and further reduced the precision of the estimates. The same general results were produced when analyzing labor and capital income inequality. Overall, the instrumental variables approach failed to improve upon the first differences analysis. Future work will explore alternative methods for improving causal inference.

6 Conclusion

One of the most notable differences between the U.S. political economy of the 1960s and that which has existed since the 1980s is the explosion of one specific kind of financial activity: mergers and acquisitions between companies with substantial assets by any definition. There is little question that this change in economic behavior, and its concomitant effect on economic structure, coincides with substantial changes in economic ideology and public policy that either began with or substantially accelerated with President Reagan's tenure. The impact of these changes are surely felt throughout the economy even today, and though it remains an open question as to whether the overall economic effect has been positive, this paper tries to elucidate one concrete and immediate impact that is often overlooked: the impact on those who participate in the deals.

Several empirical observations flow from the analysis above. First, analyzing measures of antitrust enforcement efforts in isolation without considering the relative amount of economic conduct deserving scrutiny can lead to the false perception that agency priorities changed slowly over time when they actually changed substantially and discontinuously around 1981. Second, after this policy shift, changes in annual merger activity relative to total income are positively and significantly related to changes in top 1 percent income shares, but no discernible relationship exists prior to the policy change. Third, the size of the estimated coefficients suggests that about 12 percent of the overall change in the top 1 percent's share of labor income and about 29 percent of the overall change in the top 1 percent's share of fiscal income since 1982 is derived from profits earned on increasing amounts of M&A activity. Fourth, there is no relationship between relative merger activity and the top 1 percent's share of capital income in either period, which means that labor income (wages, bonuses, partnership profits, stock options) and not capital income (capital gains, interest, or dividends) is the primary channel by which top earners have increased their income share.

Undoubtedly, some analysts will maintain that those who profit from these large deals are rightfully being compensated for providing valuable services that command a high return in competitive labor markets. But that contention has to be weighed against the ambiguous evidence supporting the claim that these deals tend to increase firm performance or productivity. In the absence of such proof, we have to entertain the

possibility that the services of these professionals are highly valued mostly because they continue to increase the wealth of top earners.

Standard economic framing would suggest that if mergers and acquisitions are bad for firms, then the firms that pursue them will ultimately pay the price by losing stock value, facing bankruptcy or, ironically, becoming the target of another merger or acquisition. The concern raised here is that those firms—or more accurately, their workers—will pay that price only after a relatively small class of managers and other professionals are substantially enriched. This does not necessarily mean that antitrust officials should explicitly consider distributional consequences when evaluating proposed deals. But it may mean that the balance of antitrust oversight is tilted far too heavily towards “laissez-faire,” and that the managers of firms pursuing large transactions should have a higher burden of proving that their proposed deals will confer broad public benefits.

This paper also supports the view advanced by Hacker and Pierson (2010) that rising income inequality is not a natural byproduct of a changing economic landscape, but is driven by explicit policy decisions. Though the primary policy shift emphasized in this article is the deregulation of antitrust oversight involving mergers and acquisitions, other policy changes arguably fueled the explosion in relative merger activity after 1980. Those policies include lower top marginal tax rates which made the pursuit of higher wages more lucrative for wealthy professionals, and a host of financial deregulation measures that enabled investment banks and other financial institutions to offer attractive M&A financing. Together, these shifts allowed mergers and acquisitions to proliferate, but it wasn’t always so. Prior to 1981, stringent antitrust oversight and greater financial regulation kept M&A activity at low levels relative to total production, and the deals that were permitted (there were merger waves from 1950-1981) did not discernibly impact income inequality. Even if we decide that a society with relatively unregulated merger markets and high income inequality is preferable to the alternatives, we should not pretend that such a society is created by unstoppable natural forces.

These initial findings create several possibilities for future work. As indicated above, causal inference in the present analysis can be improved, potentially with better instrumental variable models. The FTC also publishes an extensive printed report on mergers and acquisitions in mining and manufacturing above a lower nominal price threshold (\$10 million instead of \$100 million), and that data includes the standard industrial classification code of the merging companies. It should therefore be possible to explore the relationship between M&A activity and other dependent variables, like average industry wages and employment levels, both before and after 1982. It will also allow me to repeat the design above with a lower threshold for deal value to determine if that improves the accuracy of the estimated coefficients.⁷

The analysis would also benefit from a comparative perspective, or from leveraging geographic variation within the U.S. It appears that the SDC database also includes data on European mergers and acquisitions since 1984 (Martynova and Renneboog 2006), so the analysis above could be replicated using top income shares of individual European nations. Such comparisons would be especially helpful if individual European nations or groupings of nations maintained different regulatory attitudes towards mergers and acquisitions

⁷This work is ongoing and preliminary results may be available by the time of the conference.

or experienced a push for deregulation at different times, and if the SDC data could be supplemented (as here) with comparable measures of activity prior to 1984. Similarly, further consideration needs to be given to whether cross-border transactions mediate the effect size. Within the United States, the individual states also regulate anticompetitive behavior, and so further work could be done to determine whether state laws have differentially counteracted relatively lax federal oversight since 1981 or whether geographic variation in merger activity is associated with income inequality.

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