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## Social Class and Income Inequality in the United States: Ownership, Authority, and Personal Income Distribution from 1980 to 2010

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### Abstract

This study outlines a theory of social class based on workplace ownership and authority relations, and it investigates the link between social class and growth in personal income inequality since the 1980s. Inequality trends are governed by changes in between-class income differences, changes in the relative size of different classes, and changes in within-class income dispersion. Data from the General Social Survey are used to investigate each of these changes in turn and to evaluate their impact on growth in inequality at the population level. Results indicate that between-class income differences grew by about 60 percent since the 1980s and that the relative size of different classes remained fairly stable. A formal decomposition analysis indicates that changes in the relative size of different social classes had a small dampening effect and that growth in between-class income differences had a large inflationary effect on trends in personal income inequality.

### Keywords

social class; income inequality; ownership; authority; time-series analysis

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The distribution of personal income in the U.S. has become substantially more unequal since the early 1980s, reversing a general trend of declining inequality that dated back to the 1930s. During the 1980s and early 1990s, incomes in the lower half of the distribution stagnated and then declined, while incomes at the top of the distribution increased. During the late 1990s and 2000s, incomes in the lower part of the distribution ceased declining but did not rebound from the losses of previous decades, while top incomes continued their ascent (McCall and Percheski 2010; Morris and Western 1999; Piketty and Saez 2003).

An individual's position within the ownership and authority structure of an economic organization is a central determinant of personal income (Dahrendorf 1959; Marx 1978; Proudhon 2011; Wright 1979, 1985). At a simple level, there are four distinct groups defined by their position within workplace ownership and authority relations: proprietors, who own the means of production and control the activities of others; managers, who do not own the means of production but do control the activities of others; workers, who control neither the means of production nor the activities of others; and independent producers, who own and

operate small firms by themselves. These groups are referred to as social classes, and they are thought to possess antagonistic interests and to frequently engage in conflict with one another (Wright 1979; Wright and Perrone 1977). Social classes are linked to the distribution of personal income through supply and demand for different factors of production, economic rents that emerge from market distortions and incentive problems, and the balance of intergroup bargaining power (Marx 1976; Proudhon 2011; Wright 1979, 1985, 1997).

Despite the centrality of social classes in theories of personal income distribution, they have not played an important role in empirical attempts to explain the recent growth in income inequality. Prior studies have instead focused on the effects of disaggregate occupations (Mouw and Kalleberg 2010; Weeden et al. 2007), skill-biased technical change and increasing returns to education (Autor, Levy, and Murnane 2003), institutional change and its impact on low-wage workers (Card, Lemieux, and Riddell 2004; DiNardo, Fortin, and Lemieux 1996), and demographic shifts (Borjas 1994; Easterlin 1980). No definitive explanation for changes in the distribution of personal income has emerged from this extensive volume of research, and prior models of distributional trends leave considerable room for improvement (McCall and Percheski 2010; Morris and Western 1999).

Among the few recent studies related to social class and income inequality are several that investigate changes in the functional, rather than personal, distribution of income and find that the labor share declined relative to the capital share since the early 1980s (Kristal 2010, 2013; Lin and Tomaskovic-Devey 2013; Piketty 2014).<sup>1</sup> In addition, several other recent studies provide evidence of an association between social class and rising personal income inequality. For example, research on executive compensation reveals a pattern of strong earnings growth for upper management (Frydman and Jenter 2010; Goldstein 2012); recent work on inequality of capital ownership suggests that it is rising (Piketty 2014); and research on economic elites indicates that earnings from financial investments have become an increasingly important source of income for this group over the past several decades (Nau 2013; Volscho and Kelly 2012).

While these studies suggest an important relationship between social class and changes in the distribution of personal income, they do not link a well-defined social class typology to growth in personal income inequality nor do they provide a precise accounting of how changes in factor shares, capital concentration, or executive compensation contributed to growth in personal income inequality at the population level. These various trends may correspond, but a significant impact for changes in social class inequality on patterns of personal income distribution cannot simply be assumed. Rather, the link between social

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<sup>1</sup>The personal distribution of income shows how income, regardless of its source, is divided between individuals, while the functional distribution of income shows how income is divided between various sources—in particular, between the productive factors of labor and capital. That is, the functional distribution describes the share of total income that comes from payments to labor versus capital. As a measure of total income inequality, the functional distribution is limited because it contains no information about the distribution of factor income across individuals. As a measure of social class inequality, the functional distribution is also limited because it includes all salaries, benefits, and bonuses paid to firm executives in the labor share. This is problematic not only because managers are thought to occupy a social class position distinct from that of non-managerial workers but also because many of these executives are owners or majority shareholders in their companies and isolating the components of their income that accrue to labor versus capital is fundamentally ambiguous. Detailed analyses of labor's share show that it has been “buoyed up” over time by large compensation payments to managers, many of whom likely own at least part of the business they operate (Elsby, Hobijn, Sahin 2013; Piketty 2014).

classes and growing personal income inequality must be subjected to rigorous empirical investigation.

Several other studies have directly linked growth in personal income inequality to class typologies defined in terms of large occupational groups with similar skill requirements, job tasks, and career trajectories (Morgan and Cha 2007; Morgan and Tang 2007; Weeden et al. 2007). But *social* class divisions based on exclusionary relations of production and *occupational* class divisions based on the technical division of labor are distinct forms of stratification, and the occupational class typologies used in prior research have only a tangential link to workplace ownership and authority (Kalleberg and Griffin 1980). The few empirical studies of personal income distribution that explicitly model the returns to ownership and authority rely exclusively on cross-sectional data that predate the recent increase in inequality (Halaby and Weakliem 1993; Kalleberg and Griffin 1980; Robinson and Kelley 1979; Wright 1979; Wright and Perrone 1977). As a result, previous research provides little information about the link between social classes and growth in personal income inequality since the early 1980s.

Beyond being largely ignored in empirical research on trends in personal income inequality, the concept of social class has also recently come under attack as a number of social scientists increasingly question its relevance to contemporary patterns of social stratification (Clark and Lipset 1991; Kingston 2000; Pakulski and Waters 1996). According to post-class theory, the link between social class and patterns of inequality has weakened over time—that is, while historically important, social class divisions are no longer significant determinants of material inequalities in post-industrial society. Although the strong claims of post-class theorists have provoked spirited rebuttals (Hout, Brooks, and Manza 1993; Wright 1996), neither side of this debate provides an empirical assessment of the relationship between social class and the distribution of personal income over time.

This study contends that a class-analytic theory based on workplace ownership and authority relations offers an improved basis for explaining growth in personal income inequality since the 1980s. Growth in personal income inequality is governed by (1) changes in between-class income differences, (2) compositional changes in the relative size of social classes, and (3) changes in residual, or within-class, income dispersion. This study investigates each of these trends in turn and provides a formal decomposition that evaluates their relative impact on growth in personal income inequality at the population level. In addition, it evaluates whether accounting for social class divisions based on ownership and authority improves the fit of models based on human capital characteristics, aggregate occupational classes, and disaggregate occupational classes. It also uses multivariate decomposition methods to evaluate the relative impact of human capital, occupational, and social class differences on growth in personal income inequality. Results from the General Social Survey (GSS) indicate that social class differences are essential for understanding contemporary trends in the distribution of personal income. More specifically, social class models capture important distributional changes with large effects on population-level trends in income inequality that are obscured in alternative models based on human capital characteristics and occupations.

This study makes several contributions to theory and research on social class and income inequality. First, it outlines a simple class-analytic framework for the analysis of long-term changes in personal income distribution. Second, it tests several key implications of this framework using nationally representative time-series data and provides population-based estimates of changes in social class structure and social class inequality since the 1980s. Third, it extends previous research on the functional distribution of income by examining social class differences in the personal distribution of income and by directly linking these differences to growth in personal income inequality. Finally, this study extends prior research on skill-biased technical change and shifts in the occupational structure by comparing the proposed class-analytic framework with these alternative explanations for growth in personal income inequality.

## OWNERSHIP, AUTHORITY, AND SOCIAL CLASS

The term “class” is perhaps the most disputed and confused concept in the social sciences (Wright 1979). Descriptive conceptions of class use categories like “the rich,” “the poor,” or “the one percent” to describe an individual's location within a distribution of some valued resource (e.g., Piketty 2014). Occupational conceptions of class focus on an individual's position within the technical division labor and its effects on their attitudes, behavior, and access to valued resources (e.g., Featherman and Hauser 1978; Weeden and Grusky 2005). Social, or relational, conceptions of class focus on how relationships between individuals at the site of production shape the distribution of valued resources, influence economic interests, and promote intergroup conflict (e.g., Dahrendorf 1959; Wright 1985). To distinguish between these different conceptions of class, I use the term “occupational class” to refer to positions within the technical division of labor and the term “social class” to refer to positions defined in terms of workplace social relations.

This study adopts a conception of social class based on workplace ownership and authority relations. Ownership refers to control over the physical means of production, and authority refers to control over other individuals involved in the production process. Social classes are defined as conflict groups with objectively antagonistic interests that emerge from their position within workplace ownership and authority relations. At a high level of abstraction, social classes are composed of proprietors, managers, workers, and independent producers. Proprietors own the means of production and control the activities of workers. Managers do not own the means of production, but they do control the activities of workers. Workers lack control over the means of production and over the activities of others within the production process, and they labor under the direction of proprietors and managers. Independent producers control the means of production within a self-operated enterprise but do not control the activities of others.

This social class typology is informed by several approaches to class analysis within the conflict theoretical framework (e.g., Dahrendorf 1959; Marx 1976, 1978; Wright 1979, 1985, 1997).<sup>2</sup> Marx (1976), for example, held that social class divisions are based on

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<sup>2</sup>Furthermore, slight variations on this typology have been used in several prior studies of ownership, authority, and individual-level outcomes (Halaby and Weakliem 1993; Kalleberg and Griffin 1980; Robinson and Kelley 1979; Wright and Perrone 1977).

differences in property ownership and that exploitation, defined as the appropriation of workers' surplus labor by property owners, polarizes class interests and provokes conflict between them. Dahrendorf (1959), by contrast, viewed differences in authority as the defining feature of class structure and argued that domination, or the control over others' behavior by those in positions of authority, is the mechanism driving social class conflict. Similarly, Wright (1979, 1985, 1997) developed several social class models based on differences in ownership and authority, among other factors, such as skills, and argued that class conflict is rooted in exploitation, now redefined as a process in which some classes, by virtue of their exclusionary control over different resources, appropriate part of the social surplus produced through the efforts of others.

The theoretical framework guiding this analysis builds on these prior approaches, as well as others (e.g., Roemer 1982; Screpanti 2003; Tomaskovic-Devey 2014), by defining exploitation and domination—the conditions that give rise to antagonistic interests and thus promote conflict between social classes—in counterfactual terms. Specifically, exploitation and domination are defined in terms of counterfactual comparisons between feasible alternative enterprises. An alternative enterprise is feasible when it can be realized without changing technologies or resource endowments but merely by changing the way a firm is socially organized. Exploitation, then, is said to exist in a firm with unequal property and authority relations if democratizing these social relations would increase the material welfare of workers and decrease the material welfare of proprietors and managers. Domination is similarly defined in counterfactual terms, except the outcome of interest is not material welfare but rather the scope for self-determination. Specifically, domination is said to exist in a firm with unequal property and authority relations if democratizing these relations would increase the self-determination of workers and decrease the self-determination of proprietors and managers. Under these conditions, the interests of different social classes are polarized. Proprietors and managers have an objective interest in maintaining the unequal social relations from which they benefit, while workers have an objective interest in challenging the social relations from which they suffer. Independent producers, who operate small enterprises by themselves, do not have interests that objectively conflict with workers, proprietors, or managers.

Although many theorists in the class-analytic tradition (e.g., Marx 1978; Wright 1979, 1985) assume that the mere existence of unequal ownership and authority relations leads to exploitation and domination, the counterfactual approach highlights the contingent nature of these phenomena: a democratic transformation of workplace ownership and authority relations need not give rise to the pattern of effects on material welfare and self-determination described previously. For example, worker participation in management may introduce inexperienced personnel to the decision-making process, which could harm productivity and thereby decrease, rather than increase, the material welfare of workers. In addition, self-determination may not be appreciably enhanced among workers if supplanting hierarchical with horizontal management requires high levels of peer monitoring, supervision, and control to sustain comparable levels of productivity. Finally, because incentives to innovate, save, and invest are sensitive to the strength of property rights, an economy with widespread proliferation of democratic firms may grow at a slower rate than an economy based exclusively on private ownership of firms, possibly leading to lower,

rather than higher, levels of material welfare for workers over the long term. In other words, the level and growth rate of economic output is endogenous to the social relations of production.

The presence or absence of exploitation and domination is therefore an empirical question, the answer to which depends on extant social class inequalities and the sensitivity of these inequalities to changes in workplace social relations. Research comparing individuals in conventional versus democratically organized firms is rather limited and plagued by selection problems, but there is at least some empirical evidence suggesting that exploitation and domination are fairly common conditions. Economic models of utility maximizing agents in a competitive market economy imply that the earnings of members in a worker-owned and managed cooperative firm would exceed the earnings of workers in a capitalist firm where those who supply the firm's capital and manage production operations enjoy the residual returns (Craig and Pencavel 1992, 1995). Consistent with these models, empirical research suggests that cooperative members tend to be slightly more productive and to have higher levels of compensation, job security, and job satisfaction than their counterparts in capitalist firms (Bartlett et al. 1992; Blasi, Conte, and Kruse 1996; Burdin and Dean 2009; Craig and Pencavel 1992, 1995; Levine and Tyson 1990; Kruse and Blasi 1995; Kruse, Freeman, and Blasi 2010). Another implication of these models is that, other factors being equal, owners and managers in capitalist firms would have lower levels of material welfare if their enterprises were reorganized and operated as cooperatives.

Nevertheless, the counterfactual approach suggests that exploitation and domination are likely contingent conditions that vary across time, space, and firms. Moreover, even when exploitation and domination are definitively present in a firm, the process by which the objectively antagonistic interests linked to the presence of these conditions are translated into overt intergroup conflict is itself contingent and variable. This process likely depends on the severity of exploitation and domination in a given actor's firm; the severity of exploitation and domination in other firms across the economy; the accuracy with which social actors perceive the severity of exploitation and domination both in their own firm and across other firms; and the value that individuals place on enhancing their material welfare and self-determination. These contingencies imply, for example, that overt social class conflict is more likely when exploitation and domination are both severe and widespread across firms; when these conditions are accurately perceived by the individuals involved; and when these individuals highly value material welfare and self-determination. In contrast, social class conflict is less likely when exploitation and domination are not severe or are relatively infrequent conditions across firms, making horizontal moves to non-exploitative and non-oppressive firms a conflict mitigating possibility; when individuals fail to perceive the presence of severe and widespread exploitation and domination; or when individuals place less value on material welfare and self-determination.

The counterfactual approach also clarifies the importance of gradational differences among social classes. Specifically, gradational differences in ownership and authority are thought to moderate the effects of workplace democratization on material welfare and self-determination. For example, the negative effects of democratizing workplace ownership and authority relations for proprietors and managers would not be evenly distributed among



members of these groups. They would likely be much more pronounced for large proprietors and high-level managers than for small proprietors and low-level managers simply because those at the top of the ownership and authority structure have more to lose. Thus, the level of antagonism between workers, managers, and proprietors should be an increasing function of gradational differences in ownership and authority. These gradational differences among social classes are termed class strata.

Finally, the counterfactual approach underscores the conceptual distinction between social classes (i.e., conflict groups with objectively antagonistic interests based on their position within workplace social relations) and other production-based groups defined in terms of occupational or skill differences. According to this approach, occupational and skill inequalities do not lead to exploitation, domination, and the consequent antagonistic interests that define social class divisions for several reasons. First, because skills are inalienable, an alternative enterprise without skill inequality does not satisfy the feasibility condition given that it could only be realized by changing resource endowments (i.e., the supply of skills) and not merely by changing social relations within the firm.<sup>3</sup> Second, because occupational differences reflect, at least in part, technological conditions and specialized skill requirements within the production process, an alternative enterprise without occupational differences also does not satisfy the feasibility condition because reorganizing the technical division of labor would require changing both resource endowments and technologies. Thus, skill and occupational differences are not directly linked to exploitation or domination, and they are treated as conceptually distinct from social class divisions.

Although this theoretical framework is closely informed by several alternative approaches to class analysis, it remains distinctive in several regards. It differs from neo-Durkheimian (Weeden and Grusky 2005) and neo-Weberian theories of class (Erikson and Goldthorpe 1992; Featherman and Hauser 1978) in that it views occupational groups based on the technical division of labor and conflict groups based on the social relations of production as distinct phenomena with independent effects on material welfare, attitudes, and behavior. It differs from traditional Marxist theories of class primarily in its conflicting view on authority, which for Marx was not a unique basis for class divisions. On this point, the approach outlined here has much in common with neo-Marxist theory (e.g., Wright 1985), whose emphasis on rights and powers over both the means of production and “organizational assets” resonates with the proposed framework’s focus on ownership and authority. However, the approach outlined in this study differs from other elements of neo-Marxist theory—in particular, the latter’s equation of skill inequalities with social class divisions along with its conception of exploitation as an unconditional, rather than contingent, feature of capitalist firms.

The theoretical tradition most consistent with the proposed class-analytic framework is arguably the anarchist tradition, and specifically, the work of Proudhon (1994, 2011). Few

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<sup>3</sup>In this context, “inalienable” means that skills (i.e., different types of abilities or talents) are embodied in individuals and cannot be readily dispossessed. It does not imply that the subjective valuation of skills is independent of the interactions between individuals in a firm or market.

social theories have been as misunderstood as anarchism. In popular discourse, the term is often equated with chaos or disorder, but in fact, anarchist theory contains an elaborate and incisive analysis of the causes of economic inequality, the most important of which are thought to be ownership, authority, and the conflict generated by these social relations (McKay 2011). Proudhon (1994, 2011) argued, among other things, that unequal ownership and authority, but not skill differences, engender exploitation, domination, and intergroup conflict; that certain forms of ownership, such as that characteristic of independent producers or small proprietors, do not lead to exploitation and domination; that social class conflict is erratic rather than progressive in its course; and finally, that a collection of independent producers and worker-directed cooperative firms operating within a competitive market, as opposed to state ownership and management of production, would approximate an economic system free of exploitation, domination, and social class conflict. In different ways, these ideas are all reflected in the counterfactual approach outlined here.

This approach has several specific advantages over alternative conceptions of exploitation, domination, and social class. First, it avoids the labor theory of value. In other words, there is no assumption that the value of a commodity is intrinsically determined by the labor required to produce it. This flawed assumption complicates approaches to exploitation that define it terms of labor transfers (e.g., Marx 1976; Roemer 1982). Second, the counterfactual approach accommodates the possibility that the level and growth rate of economic output may be endogenous to the social relations of production. This type of endogeneity complicates approaches to exploitation that define it in terms of “surplus appropriation,” which implicitly assume a highly invariant level of economic output across different modes of production (e.g., Wright 1984, 1985, 1997). Finally, the counterfactual approach avoids normative assumptions about the overall desirability of different institutional arrangements, organizational forms, or resource distributions. It simply provides an analytic device for explaining why individuals that occupy different positions within the social relations of production might be expected to think and behave in conflicting ways.

## **SOCIAL CLASS STRUCTURE AND INCOME INEQUALITY**

A variety of different mechanisms link property ownership and authority to personal income, including the supply and demand for different factors of production, economic rents that emerge from market distortions and incentive problems, the balance of bargaining power between social classes, and state institutions. Several perspectives within the conflict theoretical framework suggest that these distributional mechanisms are shaped primarily by three interrelated forces, with important consequences for social class structure and social class inequality: the intensity of market competition, technological development, and class-based political conflict (Marx 1976, 1978; Proudhon 1994, 2011; Wright 1985, 1997).

First, market competition is thought to have a paradoxical tendency to reduce the number of competitors and to promote concentration of the means of production among an increasingly selective group of proprietors and managers. A natural consequence of market competition is that larger and better endowed enterprises use their advantages to eliminate or absorb inferior firms. As a result, the means of production may become more and more concentrated among a shrinking group of large proprietors and high-level managers over



time. A paradoxical shift toward greater economic concentration, then, is thought to follow periods of heightened market competition, and this is expected to reduce the relative number of proprietors and managers, generate rent income for large proprietors and high-level managers, and weaken the bargaining position of workers. The sudden emergence and rapid escalation of foreign competition with American business during the 1970s is well documented (Bluestone and Harrison 1982), and consistent with arguments about the paradoxical effects of competition, most indicators show that the pace of industrial monopolization and capital concentration accelerated in subsequent decades (Foster, McChesney, and Jonna 2011; Piketty 2014).

Second, although technological development should lead to greater output, lower costs, and a general increase in material welfare, it may also have contradictory effects that render these positive impacts more elusive for certain social classes (Marx 1976; Proudhon 1994, 2011). Specifically, technological change may promote economic concentration because it conveys a competitive advantage to larger and better endowed firms who are capable of financing and implementing the new technology. Technology may also be used to subvert organization and collective action on the part of workers, and it often enhances the scope for capital mobility, both of which increase competition among workers and shift the fulcrum of bargaining power in favor of large proprietors and high-level managers (Bluestone and Harrison 1982; Proudhon 2011). In addition, because technological development often displaces workers, periods of rapid innovation may yield a chronic oversupply of labor, which suppresses wages and further enhances the bargaining power of proprietors and managers (Proudhon 2011).

The recent period of growing income inequality is marked by two types of technological development thought to exert these types of contradictory effects: (1) improvements in transportation and communication, such as high-speed air travel, high-volume shipping, and rapid telecommunications, and (2) advances in automation and computers. Improvements in transportation and communication technology have increasingly allowed production operations to be conglomerated, geographically dispersed, and swiftly relocated (Bluestone and Harrison 1982; Levinson 2008). Growing capital mobility since the 1970s is evidenced by increased employment losses due to plant relocations, shutdowns, and cutbacks; the disproportionate increase in foreign versus domestic investment; and the transfer of manufacturing employment from the Northeast and Midwest to the South and abroad (Bluestone and Harrison 1982). Advances in automation and computers are also linked to worker displacement and declines in worker bargaining power. For example, evidence suggests that these technologies lowered aggregate demand for workers performing routine manual or cognitive tasks (Autor, Levy, and Murnane 2003) and were implemented by industrial managers in ways designed to undermine worker organization (Noble 1984).

Finally, in addition to changes in the competitive environment and technology, the escalation or abatement of organized political activities on the part of different social classes may affect income distribution through their influence on the institutional landscape. Research on class-based forms of collective action indicates that the 1970s and 1980s were a period of unprecedented political mobilization by large proprietors and high-level managers (Mizruchi 2013; Useem 1984). Business political activity, including the practice of anti-union tactics,

subvention of political candidates, establishment of nonprofit policy organizations, and use of issue advertising, greatly intensified during this period. For example, worker firings during union election campaigns increased roughly threefold between 1976 and 1986 (Schmitt and Zipperer 2009), and between the late 1960s and early 1980s, the number of corporate political action committees increased from about 100 to more than 1,000 (Useem 1984). Although it is difficult to draw direct causal connections between shifts in class-based political activity and institutional change, the weight of the evidence suggests a strong correspondence. The political mobilization of large proprietors and high-level managers during the 1970s and 1980s was closely followed by a set of institutional changes, such as de-unionization, regressive reforms to the tax code, and freezes in the nominal minimum wage, thought to depress worker compensation and shift income toward those in positions of ownership and authority (Morris and Western 1999).

Several hypotheses emerge from the foregoing discussion. Growing economic concentration, the technological displacement of workers, and shifts in relative bargaining power suggest a substantial increase in between-class income differences driven by growing incomes for managers and proprietors together with stagnating or declining incomes for workers and independent producers. These divergent income trajectories are anticipated to be even more pronounced for the highest-earning upper strata of proprietors and managers because economic concentration, technological change, and shifts in bargaining power are thought to be most consequential for large enterprises and those near the top of workplace authority hierarchies. By extension, changes in income differences between social classes, and especially between social class strata, are anticipated to have a large inflationary effect on trends in personal income inequality since the 1980s.

Changes to the competitive environment and technology also suggest several different trends in the relative size of social classes since the 1980s. Specifically, growing economic concentration implies a decline in the proportion of proprietors and independent producers, and a corresponding increase in the proportion of workers. The effect of economic concentration and technological development on the relative number of managers, however, is somewhat less clear. For example, growing economic concentration may give rise to increasingly complex administrative bureaucracies, which would increase aggregate demand for managers and exert upward pressure on their relative number over time. By contrast, economic concentration and technological development may also improve the efficiency with which managerial labor is utilized. When production is automated and organized within a smaller number of larger enterprises, fewer individuals may be needed to supervise and direct the activities of workers. In addition, as large firms become more insulated from competition and begin to saturate the markets for their products, it may become increasingly difficult for them to generate new revenue. In this situation, firms might seek to boost profits by aggressively cutting costs, and managers at the middle or bottom of authority hierarchies, who are responsible for a disproportionately large share of a firm's wage bill, may be targeted for removal. These forces would exert downward pressure on the proportion of managers over time.

In sum, the evolution of market competition and technological development suggest a decline in the proportion of independent producers; a decline in the proportion of

proprietors; stagnation or perhaps a slight decline in the proportion of managers; and an increase in the proportion of workers since the 1980s. These changes are anticipated to have a small dampening effect on trends in personal income inequality because they involve shifts in the composition of the population away from social classes that typically earn highly variable incomes well above the population average toward a social class whose members typically earn less variable incomes closer to the population average.

## ALTERNATIVE THEORIES

### The Post-class Perspective

In sharp contrast to class-analytic theory, the post-class perspective contends that technological, competitive, and political changes have attenuated, rather than amplified, between-class income differences, and expanded, rather than contracted, the relative number of proprietors, managers, and independent producers (Bell 1973; Pakulski and Waters 1996; Pakulski 2005). First, according to this perspective, technological development has transformed production from a system based on large capital-intensive enterprises into a system in which scale economies are less important and small dynamic firms flourish (Bell 1973; Pakulski and Waters 1996). These changes, in turn, are held to promote a progressive redistribution of productive wealth and a “reduction in the saliency of property in structuring...patterns of economic allocation” (Pakulski and Waters 1996:75). Technological development is also thought to enhance demand for skilled managerial decision-making as a result of the growing complexity of production operations. Thus, according to this perspective, ownership of the means of production has become more decentralized, a large number of small firms have entered increasingly competitive markets, and demand for managerial tasks has increased, leading to a decline in income for proprietors, an increase in income for managers, and comparatively faster growth in the number of proprietors, managers, and independent producers relative to workers.

The post-class perspective also argues that “the significance of class as a basis for political identification and behavior and as a force for change has been declining” (Pakulski and Waters 1996:132). According to this view, the effects of class-based politics on state and labor market institutions intensified during the early twentieth century, but “a reversal of this trend took shape between 1960 and 1990” (133). Owing to a purported disconnect between social class and partisanship together with a decline in class-based political organizations, “politics...is ceasing to be a distributive game monopolized by corporate actors” (142). If the ability of proprietors and managers to influence income distribution through political activism has waned rather than intensified over recent decades, their income shares would be expected to stagnate or decline.

Thus, post-class theory is essentially a negation of the class-analytic perspective. It predicts stagnating or declining income differences based on workplace ownership and authority, which implies a null or dampening effect of changes in between-class income differences on trends in personal income inequality. It also predicts an increase in the relative number of proprietors, managers, and independent producers, and a decline in the relative number of workers, which implies a small inflationary effect of changes in relative class size on growth in personal income inequality.

## Skill-biased Technological Change

Unlike post-class theory, the skill-biased technological change perspective does not provide competing, or mutually exclusive, hypotheses with respect to class-analytic theory. Rather, it points toward a set of alternative and potentially confounding human capital factors, such as education and other cognitive abilities, which must be addressed alongside social class in research on personal income distribution. This perspective contends that the introduction of new technologies, such as personal computers, has increased demand for analytic skills and displaced large numbers of workers who perform routine tasks (Autor, Katz, and Kearney 2008; Autor, Levy, and Murnane 2003). Because highly educated workers are thought to have realized relatively larger gains in productivity through the introduction of computers, the well-documented increase in the income returns to education provides considerable evidence of skill-biased technical change (Autor, Katz, and Kearney 2008). Additional support for this perspective comes from studies finding that workers who use computers on the job earn higher wages than comparable workers who do not use computers (Krueger 1993), that highly educated workers are more likely to use computers (Card and DiNardo 2002), and that occupation-based measures of skill reveal increasing demand for abstract reasoning abilities and declining demand for routine skills (Autor, Katz, and Kearney 2008; Autor, Levy, and Murnane 2003). The class-analytic perspective hypothesizes that additionally accounting for workplace ownership and authority in models based on education and other human capital characteristics will provide an improved explanation of changes in personal income distribution since the 1980s.

## Occupational Class Models

Occupational classes refer to aggregate or disaggregate groups of functionally, technically, or contractually similar jobs (Erikson and Goldthorpe 1992; Featherman and Hauser 1978; Weeden and Grusky 2005). Occupational class divisions based on the technical division of labor are conceptually and empirically distinct from social class divisions based on workplace ownership and authority (Kalleberg and Griffin 1980; Wright 1979). Although ownership and authority relations at the site of production are partly expressed through occupational differences, prior research shows that social class divisions are common within occupational classes, that occupational divisions have become deeply embedded within social classes, and that social versus occupational class differences in job rewards are unique and separable (Kalleberg and Griffin 1980; Wright 1979).

Aggregate occupational classes are, at least in part, proxies for human capital, and thus may be linked to growing income inequality through skill-biased technical change (Weeden et al. 2007). Aggregate occupational classes may also be connected to different forms of rent extraction insofar as they are institutionalized in societal-level patterns of unionization, collective bargaining, and other forms of social closure (Morgan and Cha 2007; Morgan and Tang 2007; Weeden et al. 2007). Because of de-unionization and the proliferation of occupational closure movements since the 1980s, income differences between aggregate occupational classes are anticipated to have increased over time. Consistent with these arguments, prior research documents a modest degree of income divergence between classes in several different aggregate occupational typologies (Morgan and Cha 2007; Morgan and Tang 2007; Weeden et al. 2007).

A number of researchers contend that disaggregate, rather than aggregate, occupational classes are more closely associated with material inequalities (Grusky and Sorensen 1998; Weeden and Grusky 2005). The starting point for the disaggregate approach is the “unit occupation,” which is defined as a small group of “technically similar jobs that is institutionalized in the labor market” (Grusky 2005:66). According to this perspective, unit occupations are more strongly linked to income inequality than are aggregate occupational classes because the forces of supply and demand, social closure, and institutionalization operate primarily at the disaggregate level. Thus, because of shifting demand for occupations requiring different types of human capital and the growing use of licensure, registration, and certification to erect steep barriers to occupational entry, income differences between disaggregate occupational classes are anticipated to have grown substantially over time. Consistent with this perspective, prior studies document steady growth in income differences between classes in disaggregate occupational typologies (Mouw and Kalleberg 2010; Weeden et al. 2007). The class-analytic perspective outlined in this study hypothesizes that additionally accounting for social class divisions in models based on both aggregate and disaggregate occupational class divisions will provide an improved explanation of changes in personal income distribution.

## METHODS

### Data and Measures

I use data from the 1980 to 2010 waves of the GSS, which contain demographic, employment, and income data from nationally representative samples of non-institutionalized adults in the U.S. (Smith et al. 2011). The GSS is well-suited for this study because, unlike other omnibus national surveys, it contains reasonably accurate measures of both social class and personal income from repeated cross-sections of the population throughout the recent period of growing inequality. The GSS waves of interest were collected annually from 1980 to 1994—except in 1981 and 1992—and biennially thereafter. I focus on the period from 1980 to 2010 because it brackets recent growth in income inequality and because it is the period for which data on ownership, authority, and personal income are available from sufficiently large samples in the GSS.<sup>4</sup> The 1980 to 2010 cumulative analytic sample consists of 22,071 respondents who were 18 to 65 years old and worked full-time at the date of their interviews. Parallel analyses of data that also included part-time respondents or that excluded respondents in agricultural industries produced similar results.

**Social Class**—The GSS asks respondents whether they are self-employed or work for someone else. This question is used to distinguish between employees who do not own the means of production and individuals with sufficient assets to at least gainfully employ themselves. The GSS also asks respondents whether their job involves supervising others.<sup>5</sup> Together, these two items are used to sort respondents into the four social class positions:

<sup>4</sup>Questions about personal income and workplace authority were jointly included in just three waves of the GSS during the 1970s, and in these waves, they were asked of only a random subset of respondents. As a result, the GSS lacks the data needed to support an analysis of social class and personal income inequality during the 1970s.

<sup>5</sup>The GSS uses a split-ballot survey design, and questions about supervisory authority are typically asked of a random 50 to 75 percent subset of respondents.

proprietors (self-employed and supervise others), independent producers (self-employed and do not supervise others), managers (work for someone else and supervise others), and workers (work for someone else and do not supervise others).

This study further classifies proprietors and managers into different class strata using a GSS item that asks respondents who report supervising others whether any of their subordinates are themselves supervisors. This question indicates whether managers occupy positions closer to the top of the workplace authority hierarchy, and it provides an approximate measure of the size of proprietors' firms (since larger firms are more likely than smaller firms to have multilevel authority structures). Large versus small proprietors and high-versus low-level managers are differentiated according to whether their subordinates also supervise others at work.

**Income**—Personal market income is the dependent variable of interest. This includes income earned during the previous year from an individual's job, business, or investments.<sup>6</sup> The GSS measures personal market income using interval response categories, and dollar values are imputed based on interval midpoints. For the last open-ended interval capturing the highest incomes, dollar values are estimated using a Pareto approximation (Hout 2004).<sup>7</sup> Nominal incomes are adjusted for price inflation over time using the Consumer Price Index, with the adjusted values expressed in 2011 dollars. Following convention with self-reported income data (e.g., Card and DiNardo 2002), full-time respondents who report implausibly low annual incomes are truncated (<5000 real dollars). All analyses are based on the natural log transformation of income.

**Covariates**—The covariates included in multivariate analyses are age, race, gender, education, verbal ability, parental education, geographic region, and urbanicity. Age is measured in years and expressed as a series of dummy variables for “18 to 25,” “26 to 35,” “36 to 45,” “46 to 55,” and “56 to 65” years to account to potential nonlinearities; race is expressed as a series of dummy variables for “black,” “white,” and “other” race respondents; and gender is coded 1 for female and 0 for male. Geographic region is expressed as a series of dummy variables for “Northeast,” “Midwest,” “South,” and “West.” Urbanicity is also expressed as a series of dummy variables for residence in an urban, suburban, or rural area. Both respondent and parental education are measured in years and recoded as a series of dummy variables for “less than high school,” “high school graduate,” “some college,” and “college graduate” also to account for potential nonlinearities. Verbal ability is measured with scores on the Gallup-Thorndike verbal intelligence test—a widely used ten-item vocabulary assessment with desirable psychometric properties (Alwin 1991; Thorndike 1942; Yang and Land 2006). All of these covariates are potentially powerful joint predictors of both social class attainment and personal income.<sup>8</sup>

<sup>6</sup>Research on income measurement suggests that business income may be underreported by as much as 30 percent in surveys (Hurst, Li, and Pugsley 2010). This type of measurement error would result in substantial underestimation of between-class income differences at any single point in time, but it would only impact an analysis of trends if the magnitude of measurement error changed over time.

<sup>7</sup>I also performed parallel analyses using a constant multiple adjustment in which topcoded incomes are replaced with 1.4 times the topcode threshold. Results (not shown) were very similar to those based on the Pareto approximation.

<sup>8</sup>I also conducted analyses that included controls for several different measures of social and cultural capital, such as the frequency of social interactions with others, the number of organizational memberships, and an index of “high” cultural consumption. Most of these



This study also analyses both aggregate and disaggregate occupational classes. Aggregate occupational classes are measured using a 9-category version of the Featherman-Hauser typology (Featherman and Hauser 1978), which is preferred over similar others (e.g., Erikson and Goldthorpe 1992) because it can be precisely measured in the GSS and because prior research suggests that it provides a better fit to U.S. data on material inequalities (Weeden and Grusky 2005). This typology classifies census occupational codes into the following broad categories: professional occupations, managerial and administrative occupations, sales occupations, clerical occupations, craft occupations, service occupations, operatives, general laborers, and agricultural occupations.<sup>9</sup>

Disaggregate occupational classes are measured following methods developed by Weeden and Grusky (2005). These classes are constructed to reflect “institutionalized boundaries as revealed by the distribution of occupational associations, unions, and licensing arrangements, as well as the technical features of the work itself” (156). Measurement of this typology involves collapsing Standard Occupational Classification (SOC) codes into 127 occupational micro-classes.<sup>10</sup> Specifically, this typology is based on the 1970 SOC codes. Because GSS waves collected after 1991 only contain 1980 SOC codes, I reconcile these different classifications by back-coding more recent data into the 1970 SOC scheme. This involves multiplying each observation by the number of 1970 SOC codes that contribute to the 1980 SOC code and then assigning weights to each record in the expanded dataset equal to the proportion of the 1980 SOC code drawn from the constituent 1970 SOC code.

## Analyses

The analysis proceeds in three steps. First, I analyze changes in the relative size of social classes, changes in between-class income differences, and changes in within-class income dispersion. Second, I evaluate the effects of these changes on trends in personal income inequality using a formal decomposition analysis. Finally, I compare the fit of income models based on human capital inputs, occupational class divisions, and social class divisions, and then provide a multivariate decomposition that evaluates the net effects of these different factors on trends in personal income inequality.

To investigate changes in the relative size of social classes, I estimate and plot class proportions, denoted by  $\pi_{jt} = P(C_t = j)$ , over time. In this notation,  $C_t$  is a polytomous variable with  $j = 1, \dots, 4$  categories representing the social class positions defined previously, and  $t$  denotes the time period. To investigate changes in between-class income differences, I estimate and plot trends in mean log income for each social class position,

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measures are only available in a handful of GSS waves, which precludes their inclusion in the full analysis described here. Nevertheless, results from the selected waves in which these measures are available provide no evidence that social class effects on trends in personal income inequality are simply due to the potentially confounding influence of social and cultural capital.

<sup>9</sup>In addition to this 9-category version, I also conducted analyses using a 12-category version of the Featherman-Hauser typology that incorporates distinctions between employed versus self-employed professionals, managers, and administrators, and between farmers and farm laborers. Results from this analysis are nearly identical to those presented in the main text. I focus on the 9-category version because it maintains a cleaner distinction between social relations and technical divisions.

<sup>10</sup>The original Weeden-Grusky typology has 126 occupational classes. My implementation of this typology includes an additional class for military occupations plus a residual category for a small number of respondents with missing occupational codes.

denoted by  $\mu_{jt} = E(Y_t|C_t = j)$ . Because divergent income trends between social classes may be due to confounding factors, such as increasing returns to education or other skills that are correlated with class attainment, I also estimate multivariate regressions that model mean log income as a function of social class, individual covariates, and fixed-effects for disaggregate occupations. Covariate-adjusted estimates of mean log income for each social class position are estimated and plotted across time with individual covariates and occupational dummy variables set to their sample means. To investigate changes in within-class income dispersion, I estimate and plot the variance of log income within each social class  $j$  at time  $t$ , denoted by  $\sigma_{jt}^2 = \text{Var}(Y_t|C_t)$ .

Next, I evaluate the effects of compositional, between-class, and within-class changes on trends in personal income inequality with a formal decomposition analysis of the total variance of log income, denoted by  $V_t = \text{Var}(Y_t)$ . The variance of log income is a scale-invariant measure of inequality that is subgroup decomposable and has a convenient functional relationship with other common inequality metrics, such as the Gini index (Allison 1978). At a given time period, this measure can be decomposed as follows:

$$V_t = \text{Var}(E(Y_t|C_t)) + E(\text{Var}(Y_t|C_t)) = B_t + W_t = \sum_{j=1}^4 \pi_{jt} r_{jt}^2 + \sum_{j=1}^4 \pi_{jt} \sigma_{jt}^2, \quad (1)$$

where the between-class ( $B_t$ ) and within-class ( $W_t$ ) components are expressed as weighted sums of class-specific means and variances, and  $r_{jt}^2 = (\mu_{jt} - \nu_t)^2$  is the squared deviation of mean log income for social class  $j$  at time  $t$  ( $\mu_{jt}$ ) from the population mean at time  $t$  ( $\nu_t$ ) (Western and Bloome 2009; Western, Bloome, and Percheski 2008).

With time-series data, the change in income inequality from time  $t = 0$  (the baseline time period) to  $t = t'$  (a post-baseline time period) can be decomposed into the sum of a compositional effect,  $\delta_P$ , a between-class effect,  $\delta_B$ ; and a within-class effect,  $\delta_W$ . Specifically, the change in income inequality is given by

$$V_{t'} - V_0 = \delta_P + \delta_B + \delta_W, \quad (2)$$

where the compositional effect of changes in the relative sizes of social classes is

$\delta_P = \sum_j (\pi_{jt'} - \pi_{j0}) (r_{jt'}^2 + \sigma_{jt'}^2)$ ; the between-class effect of changes in mean income for different social classes is  $\delta_B = \sum_j \pi_{j0} (r_{jt'}^2 - r_{j0}^2)$ ; and the effect of changing income dispersion within social classes is  $\delta_W = \sum_j \pi_{j0} (\sigma_{jt'}^2 - \sigma_{j0}^2)$ . I estimate each of these quantities and scale them by the change in total variance, which gives the proportionate impact of compositional, between-class, and within-class effects on trends in personal income inequality.

To investigate whether social class divisions based on workplace ownership and authority provide an improved explanation of trends in personal income distribution beyond more conventional models based on human capital characteristics, aggregate occupational classes, or disaggregate occupational classes, I compare the fit of a variety of income models with different sets of predictors. Specifically, I evaluate whether adding predictors for social class

to models of personal income based on human capital characteristics and occupational class divisions significantly improves goodness of fit. Goodness of fit is measured with the Akaike information criterion (AIC), the Bayesian information criterion (BIC), and the adjusted- $R^2$  statistic (Akaike 1974; Schwarz 1978; Theil 1961). These fit statistics penalize models with larger numbers of parameters and thus work to identify a parsimonious model with maximum explanatory power. The BIC has the most severe penalty for additional parameters, followed by the AIC and then adjusted- $R^2$ , which has the least severe penalty. Lower values of the AIC and BIC, and higher values of adjusted- $R^2$ , indicate superior model fit.

Finally, I evaluate the net effects of social class, occupational class, and human capital on growth in personal income inequality by combining multivariate decomposition methods with variance function regression (Western and Bloome 2009). In analyses of income inequality that involve  $d$  covariates with levels  $l_1, l_2, \dots, l_d$ , the data are organized in a decomposition table, where each observation is assigned to one of the  $L = l_1 \times l_2 \times \dots \times l_d$  cells in the cross-classification of all covariates. Similar to the decomposition analysis described previously, temporal trends in personal income inequality can be decomposed into the effects of changes in cell proportions, means, and variances.

Variance function regression is used to simultaneously model the cell means and variances at each time period, and the net effects of social class, occupational class, and education on trends in income inequality are quantified with counterfactual variances that fix model coefficients at their baseline values. Specifically, the variance function regression model is expressed as

$$E(Y_t | C_t, X_t, Q_t) = \alpha_t + \beta_t C_t + \gamma_t X_t + \eta_t Q_t \quad \text{and} \quad (3)$$

$$\log(\text{Var}(Y_t | C_t, X_t, Q_t)) = \theta_t + \lambda_t C_t + \phi_t X_t + \psi_t Q_t, \quad (4)$$

where  $C_t$  is a vector of dummy variables for social classes,  $R_t$  is a vector of dummy variables for education, and  $Q_t$  is a vector of dummy variables for aggregate occupational classes. I focus on aggregate occupational classes in this analysis because the GSS lacks the data needed for a multivariate decomposition based on disaggregate occupations.<sup>11</sup> Equation 3 is estimated from a least squares regression of log income on social class, aggregate occupational class, and education, stratified by time. Then, squared residuals are computed from this regression, and Equation 4 is estimated from a gamma regression of the squared residuals on social class, aggregate occupational class, and education, also stratified by time.

The net effects of social class, occupational class, and education on trends in personal income inequality are quantified by plotting counterfactual variances that fix specific regression coefficients at their baseline values. For example, to measure the net effect of changes in mean income between social class positions, I estimate and plot the following

<sup>11</sup>With a 127 disaggregate occupational classes, 4 education levels, 4 social classes, and  $T$  time periods, the multivariate decomposition table would have  $127 \times 4 \times 4 \times T$  cells. Even with a small number of time periods, the GSS does not have enough observations to sufficiently populate such a high-dimensional table.

counterfactual variance:  $V_t^{\beta_0} = \sum_{l=1}^L \pi_{lt} (\tilde{r}_{lt}^2 + \sigma_{lt}^2)$ , where the adjusted between-cell mean differences,  $\tilde{r}_{lt} = \tilde{\mu}_{lt} - \nu_l$ , are calculated from  $\tilde{u}_{lt} = \alpha_t + \beta_0 C_{lt} + \gamma_t X_{lt} + \eta_t Q_{lt}$ . In this notation,  $X_{lt}$ ,  $C_{lt}$ , and  $Q_{lt}$  denote the values of these variables associated with cell  $l$  at time  $t$  in the multivariate decomposition table. The counterfactual variance is interpreted as the level of income inequality that would have been observed had net differences in mean income between social classes remained constant since the baseline time period. I evaluate the statistical significance of these effects on trends in income inequality by using bootstrap methods to test the null hypotheses that  $H_0: V_t^{\beta_0} \geq V_t$ .<sup>12</sup>

To avoid problems associated with data sparseness, observations are pooled within decades and estimates are computed separately for the 1980s, 1990s, and 2000s in all analyses. This ensures a sufficient number of observations in each social class at each time period, improves the precision of estimates, and still allows for an informative, albeit less fine-grained, tracking of change over time. More complex analyses, including models based on fully nonparametric functions of time, provide similar point estimates for the trends of interest and do not significantly improve goodness of fit. Multiple imputation with ten replications is used to fill in missing values for all variables, and combined estimates are reported throughout (Rubin 1987).

## RESULTS

### Trends in the Relative Size of Social Classes

Figure 1 displays trend estimates of social class proportions. The upper panel of the figure displays trends for all social classes on the same scale, and the lower panel displays trends for the two smallest classes—proprietors and independent producers—using a magnified scale on the right vertical axis. Results indicate that the social class structure was fairly stable over the past three decades in question. Between the 1980s and 2000s, slight increases were found for the proportions of workers (53 to 57 percent) and independent producers (4 to 6 percent), while slight decreases were found for the proportions of managers (35 to 31 percent) and proprietors (8 to 6 percent).

Figure 2 displays trend estimates for the relative size of different social class strata. The upper panel displays estimates for all class strata, and the lower panel displays trends for the smallest strata on a magnified scale. These estimates reveal trends similar to those in Figure 1. Between the 1980s and 2000s, slight decreases were found for the proportions of both large proprietors (3 to 2 percent) and small proprietors (5 to 3 percent), and for the proportions of both high-level managers (11 to 9 percent) and low-level managers (23 to 22 percent).

These trends are difficult to reconcile with the post-class perspective and are consistent, at least in part, with class-analytic theory. The steady growth observed for the proportion of independent producers conflicts with class-analytic hypotheses, but this trend may simply

<sup>12</sup>Specifically, I compute a 95 percent confidence interval for  $V_t^{\beta_0} - V_t$  based on 2.5 and 98.5 percentiles of a sampling distribution estimated from 500 bootstrap replications. If this confidence interval falls entirely below zero, then the null hypothesis is rejected.

reflect well-documented growth in the number of nominally self-employed contingent workers, such as freelancers, homeworkers, and temporary contractors, rather than growth in the number of independent small business owners (Dale 1986; Kalleberg 2011). Nominally self-employed contingent workers differ from conventionally employed workers only in that they sell their labor power to an employer under a different type of contractual arrangement, and thus observed trends in the proportion of independent producers may be entirely consistent with class-analytic theory. This trend may also be associated with the widespread proliferation of high-speed communication technologies and personal computers, which allow employers to contract a variety of labor services from contingent workers located outside of the firm. Without more detailed data, however, this explanation remains somewhat speculative.

### Trends in Income Differences between Social Classes

Figure 3 displays unadjusted trends in mean log income. The upper panel of the figure displays estimates separately for each social class position, and the lower panel displays estimates separately for each class stratum. These estimates reveal a pronounced divergence of personal income between positions in the workplace ownership and authority structure.

Specifically, the upper panel of Figure 3 shows that incomes for proprietors increased substantially between the 1980s and 2000s. Point estimates suggest that proprietor incomes increased by about 30 percent, on average, during this period (i.e.,  $11.27 - 10.97 = 0.30$ ). In contrast, incomes for managers and workers increased by about 8 percent percent, respectively, while incomes for independent producers declined by about 5 percent. The lower panel of Figure 3 suggests that income growth was considerably greater for the upper rather than lower strata of proprietors and managers between the 1980s and 2000s. Incomes increased, on average, by about 20 percent for high-level managers and by only about 4 percent for low-level managers. Similarly, incomes increased by about 60 percent for large proprietors and by only 7 percent for small proprietors.

Figure 4 displays covariate-adjusted trends in mean log income. These estimates come from multivariate regressions that include predictors for social class, individual covariates, and disaggregate occupations. They capture divergent income trends between social classes that are not simply due to confounding factors like increasing returns to education or occupational differences in skill, prestige, and the extent of social closure. The upper panel of the figure indicates that income differences between social class positions increased over time, net of these other factors. Specifically, covariate-adjusted point estimates indicate that personal incomes for proprietors and managers increased by 27 percent and 11 percent, respectively, while incomes for workers increased by 8 percent and incomes for independent producers were stagnant. The lower panel of Figure 4 displays covariate-adjusted trends in mean log income separately by social class strata. It indicates that growth in between-class income inequality—net of individual and occupational differences—was driven primarily by pronounced income gains for large proprietors and high-level managers, consistent with the proposed class-analytic theory.

Figure 5 displays trends in total income inequality between social classes as indicated by the mean squared deviation of the estimated class means from the estimated population mean.

This metric provides a single number summary of changes in between-class income differences over time. It is scaled to equal one in the 1980s, and all values thereafter represent proportionate changes since this time period. Point estimates indicate that income differences between social class positions increased by 66 percent and that income differences between social class strata nearly doubled since the 1980s. Total income inequality between social classes, however, did not increase monotonically during this period: it declined modestly from the 1980s to the 1990s and then increased substantially thereafter.

As a comparative reference, Figure 5 also displays estimates quantifying growth in income differences between education levels and between aggregate occupational classes. Point estimates indicate that income differences between education levels and between aggregate occupational classes increased by 82 percent and 13 percent, respectively, since the 1980s. These results suggest that the overall magnitude of growth in social class inequality was much greater than growth in aggregate occupational inequality and was comparable to growth in educational inequality, although growth in income differences between education levels was monotonic and far exceeded growth in social class inequality prior to the 1990s.

### **Trends in Income Dispersion within Social Classes**

Figure 6 displays trends in within-class income dispersion. The upper panel of the figure displays residual variances for each social class position, and the lower panel displays residual variances for each social class stratum. These estimates indicate that income differences increased not only between social classes but also within them. The most pronounced increase in within-class income dispersion occurred among proprietors, with the variance of log income rising by about 50 percent for this group. In contrast, income dispersion among independent producers, workers, managers increased by about 10, 20, and 30 percent, respectively. The pronounced increase in income dispersion among proprietors was driven primarily by disproportionate income growth at the top of the distribution.

### **Decomposition of Trends in Personal Income Inequality**

Figure 7 displays trends in personal income inequality as indicated by the total variance of log income. These estimates indicate that the total variance increased by about 10 percent, from 0.45 to 0.49, between the 1980s and 1990s, and then increased by another 15 percent, from 0.49 to 0.57, between the 1990s and 2000s. Over the entire period, the total variance of log income increased by about 27 percent. Total variance estimates from the GSS suggest a higher level of income inequality overall than estimates based on other data sources, such as the Current Population Survey (CPS). This disparity is due to a greater frequency of low incomes in the GSS. For example, the first, fifth, and tenth percentiles of the personal income distribution in the GSS are about \$7,500, \$12,000, and \$16,000, respectively, while the same percentiles in the CPS are \$9,500, \$15,000, and \$19,000. Above the tenth percentile, the two distributions are similar. This suggests that midpoint imputation of incomes from the GSS interval measurement procedure may be less accurate in the lower tail of the distribution. Nevertheless, these differences are fairly modest, and the time trend in total income inequality estimated from the GSS is similar to trends estimated from other data sources, including the CPS.



Table 1 presents results from a formal decomposition of trends in personal income inequality. The upper panel of the table reports results from a decomposition by social class position. Results from this analysis indicate that compositional changes in the relative sizes of social classes had a small dampening effect and that changes in between-class income differences had a large inflationary effect on trends in income inequality, particularly from the 1990s onward. For example, point estimates indicate that growth in between-class income differences explains 18 percent of the overall increase in personal income inequality between the 1980s and 2000s, and 33 percent of the increase between the 1990s and 2000s. Between the 1980s and 1990s, however, changes in between-class income differences had a nontrivial dampening effect, and despite the strong inflationary effect of subsequent changes in between-class income differences, growth in within-class income dispersion consistently had the largest effect on trends in personal income inequality.

The lower panel of Table 1 reports results from a decomposition by social class strata. Results from this analysis indicate that changes in between-strata income differences had a substantial inflationary effect on trends in personal income inequality. Similar to the effects of social class position, the inflationary effect of growth in between-strata income differences occurs specifically from the 1990s onward. Point estimates indicate that growth in between-strata income differences explains 29 percent of the overall increase in personal income inequality between the 1980s and 2000s, and 55 percent of the increase between the 1990s and 2000s. But between the 1980s and 1990s, changes in between-strata income differences had a modest dampening effect on the trend in total inequality. Results also indicate that changes in within-strata income dispersion had a large inflationary effect and that compositional changes in the relative size of different social class strata had a small dampening effect. In sum, these results indicate that growing income differences between positions in the workplace ownership and authority structure had a substantial impact on trends in personal income inequality, especially between the 1990s and 2000s.

### **Human Capital, Occupational, and Social Class Models of Personal Income**

Table 2 presents goodness of fit statistics for models of personal income based on human capital characteristics, occupational class divisions, and social class divisions. These models are stratified by decade and thus focus on changes in income distribution over time. The first panel of the table compares a standard human capital model that includes predictors for education and demographic characteristics to models that additionally include predictors for social class. Results indicate that accounting for the social relations of production improves goodness of fit: models with dummy variables for a respondent's position in the workplace ownership and authority structure have significantly lower AIC and BIC values, and higher adjusted  $R^2$  values. The second and third panels of Table 2 compare aggregate and disaggregate occupational class models to models that additionally include predictors for social class divisions. As before, results indicate that models accounting for workplace ownership and authority improve goodness of fit. Finally, the fourth and fifth panels of the table show that models including predictors for social class divisions in addition to covariates representing both human capital characteristics and occupational class divisions also provide an improved fit to the data. Although the gains in explanatory power associated with accounting for workplace ownership and authority may appear modest in practical

terms (e.g., 2 to 5 percentage point increases in adjusted  $R^2$ ), they are comparable to the gains achieved by disaggregating occupational classes (e.g., 4 to 8 percentage point increases in adjusted  $R^2$ ), which are widely held to represent a notable improvement in the explanatory power of occupational class models (Grusky and Sorensen 1998; Weeden and Grusky 2005).<sup>13</sup>

Table 2 highlights the best fitting model according to each goodness-of-fit criterion in bold font. According to the AIC and adjusted  $R^2$  measures, the model providing an optimal balance between explanatory power and parsimony is in fact the most complex model considered in this analysis. It includes predictors for human capital characteristics, disaggregate occupational classes, and social class strata. The BIC, which includes a more severe penalty for the number of parameters and thus tends to favor more parsimonious models, indicates that the model with predictors for human capital characteristics, aggregate occupational classes, and social class strata provides the best fit. These results indicate that models of personal income based only on human capital characteristics and occupational classes, including highly disaggregate unit occupations, are suboptimal in that they fail to capture notable income differences between positions in the workplace ownership and authority structure.

Figure 8 displays counterfactual variance estimates that quantify the net effects of changes in income differences between social classes, aggregate occupational classes, and education levels on trends in total income inequality. These estimates are based on a multivariate decomposition combined with variance function regression. They extend the results presented in Table 2 by directly linking them to growth in income inequality at the population level.

Recall that the total variance of log income increased by 27 percent, from 0.45 to 0.57, between the 1980s and 2000s. In contrast, the counterfactual estimates quantifying the between-class effect indicate that the variance of log income would have increased by only 23 percent, from 0.45 to 0.55, if net income differences between social class positions had remained unchanged at their 1980s level. Similarly, the counterfactual estimates quantifying the between-strata effect indicate that the variance of log income would have increased by only 20 percent, from 0.45 to 0.54, if net income differences between social class strata had remained unchanged over time. In other words, these estimates indicate that changes in the returns to ownership and authority account for approximately 15 to 25 percent of the growth in personal income inequality since the 1980s, net of educational and aggregate occupational effects.<sup>14</sup>

The counterfactual estimates quantifying the between-education effect indicate that the variance of log income would have increased by about 24 percent, from 0.45 to 0.56, if net income differences between education levels had remained unchanged at their 1980s level.

<sup>13</sup>The gains in explanatory power associated with disaggregating occupational classes can be obtained by comparing model (D) with model (G) and model (J) with model (M) in Table 2.

<sup>14</sup>For example, when scaled by the change in observed variance, the difference between the change in observed variance and the change in the counterfactual variance for the between-class and between-strata effects are, respectively,  $((0.57 - 0.45) - (0.55 - 0.45)) / (0.57 - 0.45) = 0.14$  and  $((0.57 - 0.45) - (0.54 - 0.45)) / (0.57 - 0.45) = 0.25$ .

This suggests that increasing returns to ownership and authority had an effect on trends in personal income inequality comparable to that of increasing returns to education. The counterfactual variance estimates quantifying the effects of education and social class also indicate that increasing returns to education were particularly impactful between the 1980s and 1990s, while increasing returns to ownership and authority had a more pronounced influence between the 1990s and 2000s. Estimates quantifying the between-occupation effect indicate that changes in income differences between aggregate occupational classes had a negligible impact on trends in total income inequality, net of education and social class effects. This suggests that growing income differences between social classes had a larger impact on trends in personal income inequality than did changes in income differences between aggregate occupational classes.

## DISCUSSION

Since the 1980s, personal income inequality has increased substantially in the U.S.

Although several theoretical traditions suggest that social classes—defined in terms of ownership and authority relations within production—are closely linked to the distribution of personal income, they have not played a major role in empirical attempts to explain this trend. The present study investigates social class effects on growth in personal income inequality, and it evaluates whether social class models improve upon existing explanations for this trend that emphasize the importance of human capital and occupational classes.

Results indicate that income differences between social classes increased by about 60 percent since the 1980s. This increase was driven primarily by growing incomes for high-level managers and large proprietors together with stagnating incomes for workers and independent producers. Results also indicate that the proportions of workers and independent producers increased, while the proportions of proprietors and managers declined during this period. A formal decomposition analysis that directly evaluates the effects of these trends on personal income inequality suggests that changes in the relative size of social classes had a small dampening effect and that growth in between-class income differences had a significant inflationary effect, particularly from the 1990s onward. Finally, results indicate that accounting for social class divisions based on workplace ownership and authority improves the explanatory power of models based on human capital characteristics and occupational class divisions, which have thus far dominated research on trends in inequality.

This study makes a number of contributions to theory and empirical research on class structure and income inequality. First, it outlines a simple theoretical framework for the analysis of social class that has several advantages over alternative approaches. In particular, this framework implies a parsimonious social class typology that can be easily measured in empirical research; it maintains the conceptual and empirical distinctions between social classes (i.e., conflict groups based on exclusionary relations of production) and occupational classes (i.e., groups of individuals in functionally or technically similar jobs); it contains an explicit, flexible, and testable theory of the conditions—exploitation and domination—that are thought to engender observed patterns of social class conflict; and finally, it provides an

account of the social forces, including shifts in the competitive environment, technological development, and class political activism, that govern trends in the material welfare of different social classes over time.

Second, this study tests several key implications of this theoretical framework using time-series data from a large national survey, and it directly links changes in social class structure and social class inequality to trends in the distribution of personal income at the population level. This analysis responds to calls for historical investigations of social class inequality (Wright 1997), addresses arguments that social classes have dissolved in modern society (Pakulski and Waters 1996), and extends industry-level research on the functional distribution of income (Kristal 2010, 2013; Lin and Tomaskovic-Devey 2013) by using an individual-level model to precisely document social class effects on changes in the personal distribution of income. This type of individual-level, population-based evidence directly linking social classes to trends in personal income inequality is largely absent from the literature on social stratification in the U.S.

The weight of the evidence from this analysis casts considerable doubt on post-class theory, is generally consistent with the proposed class-analytic framework, and resonates with recent research on the capital share of national income, wealth concentration, and executive compensation (e.g., Piketty 2014). It indicates that income divergence between social classes can explain a practically and statistically significant proportion of growth in personal income inequality at the population level, particularly during the period from the 1990s to the 2000s when inequality was driven upward primarily by increasing incomes at the top of the distribution.

The explanatory power of the social class model, however, is not overwhelming. Between the 1980s and 1990s, when real declines at the bottom of the distribution were also an important driver of growth in inequality, results suggest a negligible impact for social class differences and instead point toward the importance of increasing returns to education. Moreover, across all three decades, results consistently suggest an important role for unobserved factors in explaining this trend. Indeed, within-class (i.e., residual) income dispersion was the main driver of growing inequality throughout the period under consideration. Together, these findings suggest that social class differences are but one part of a multifaceted and historically contingent explanation for growth in income inequality, where, for example, technological changes may have been skill-biased during certain periods and capital-biased during others.

Third, this study compares the proposed class-analytic theory with alternative models for growth in income inequality based on human capital and occupational differences. Results indicate that growing income differences between social classes are largely obscured in alternative models, including those based on highly disaggregate occupations. These findings suggest that critiques of “big class” models (Grusky and Sorensen 1998; Weeden and Grusky 2005), which argue that class analysis can be salvaged by focusing on “structuration” at the level of disaggregate occupations, are somewhat misguided. In particular, these critiques conflate social classes based on workplace ownership and authority relations with occupational classes based on the technical division of labor.

Although the technical division of labor partially reflects these social relations, the present study indicates that they are in fact conceptually and empirically distinct forms of stratification. Social classes cannot be conveniently disaggregated into small occupational groups, and social class differences in personal income cut across the technical division of labor. This suggests that future research on material inequalities, political attitudes, and consumption practices can be improved by jointly modeling the effects of both social and occupational class divisions. In other words, disaggregate occupational class models should complement, rather than replace, “big” social class models.

Although this study provides a number of important contributions to theory and research on social class and income inequality, it is not without limitations. In particular, it does not evaluate the more specific claims of class-analytic theory about the underlying changes responsible for long-term trends in social class structure and social class inequality, such as technological development, class political mobilization, and growing economic concentration. The results presented here suggest a correspondence between these changes and social class differences in personal income, but more detailed data are needed to rigorously evaluate the causal links between them.

In addition, this study relies on a measure of social class that may imperfectly capture differences in ownership and authority. For example, it remains unclear whether self-employment and supervisory data accurately classify wealthy rentiers who live almost entirely off of investment income and are not directly engaged in economic activity. Pure rentiers represent only a small fraction of large proprietors, but if the measurement approach used here omits this group, it may understate growth in between-class income differences over time because rentiers often earn enormously large incomes.

Finally, this analysis is based on an inexact measure of personal market income. The GSS uses a single survey item based on a series of graduated intervals to measure total money income from a respondent's main job. This is a less sophisticated instrument than those used by other national surveys, such as the CPS. It omits the value of in-kind benefits and earnings from secondary employment, and results suggest that it may understate incomes in the lower tail of the distribution. To attenuate concerns about income measurement in the GSS, I attempted to corroborate key substantive findings with data from the CPS. The CPS uses a more sophisticated measurement procedure for personal income, but it lacks the data needed to precisely measure social class. Although this precludes an exact replication with the CPS, analyses of these data using an occupation-based proxy measure of social class are generally consistent with findings from the GSS.<sup>15</sup>

These limitations highlight important directions for future research. In particular, future research should focus on whether the trends documented in this study are directly related to patterns of technological development, economic concentration, and class-based political activism. This might be accomplished by linking individual data from the GSS to information on industrial concentration from the Economic Census or to information on

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<sup>15</sup>These results are reported in the Online Supplement, which also documents the precise coding of both aggregate and disaggregate occupational classes.

corporate investment in the political process from the Federal Election Commission. These data could be used to test whether regional or inter-industry differences in social class inequality are associated with levels of market concentration or with corporate political investment. Future research should also investigate social class inequality from a longitudinal rather than an independent time-series perspective—for example, by using data from the Panel Study of Income Dynamics to examine social class differences in lifetime income across birth cohorts. In addition, future research should consider the relationship between race, gender, and social class over time, perhaps with a focus on whether status group disparities in social class attainment are linked to persistent racial and gender differences in personal income.

These limitations notwithstanding, the present study documents a significant relationship between social class and trends in personal income inequality over the past three decades, indicating that class-analytic theory remains important for understanding contemporary patterns of social stratification. As social scientists work to better understand the causes and consequences of growing income inequality, rigorous integration of class-analytic theory with quantitative empirical research will be essential.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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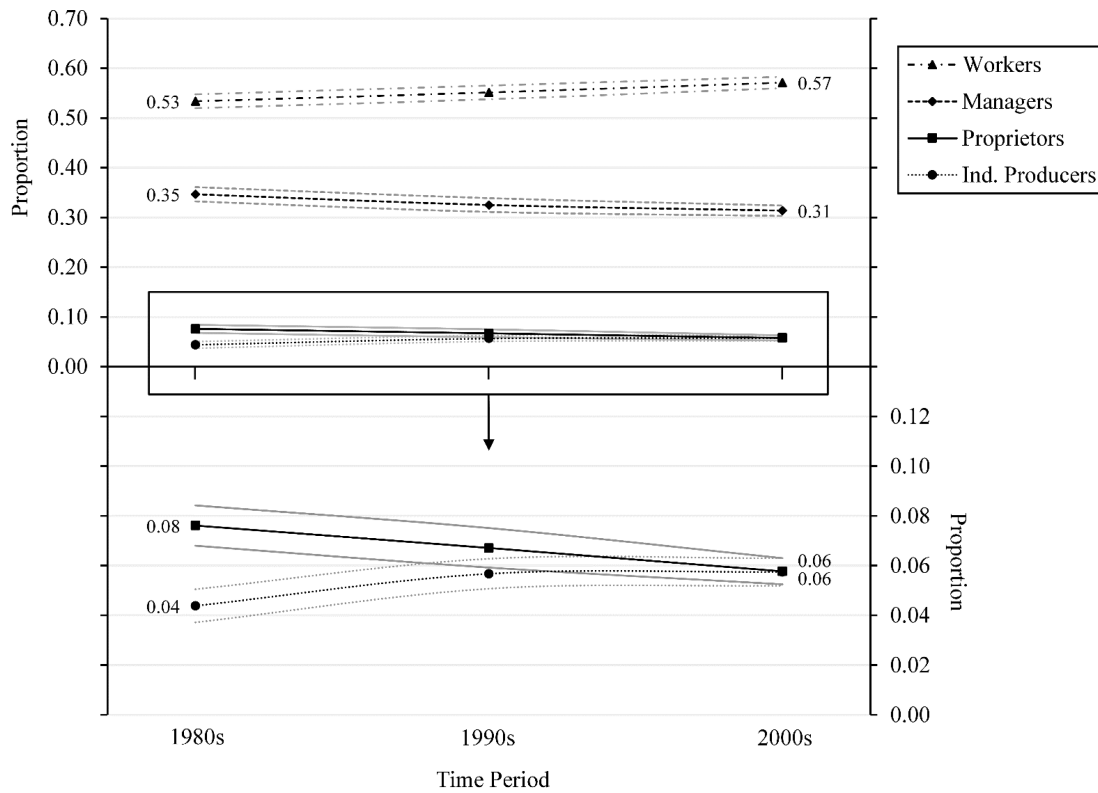
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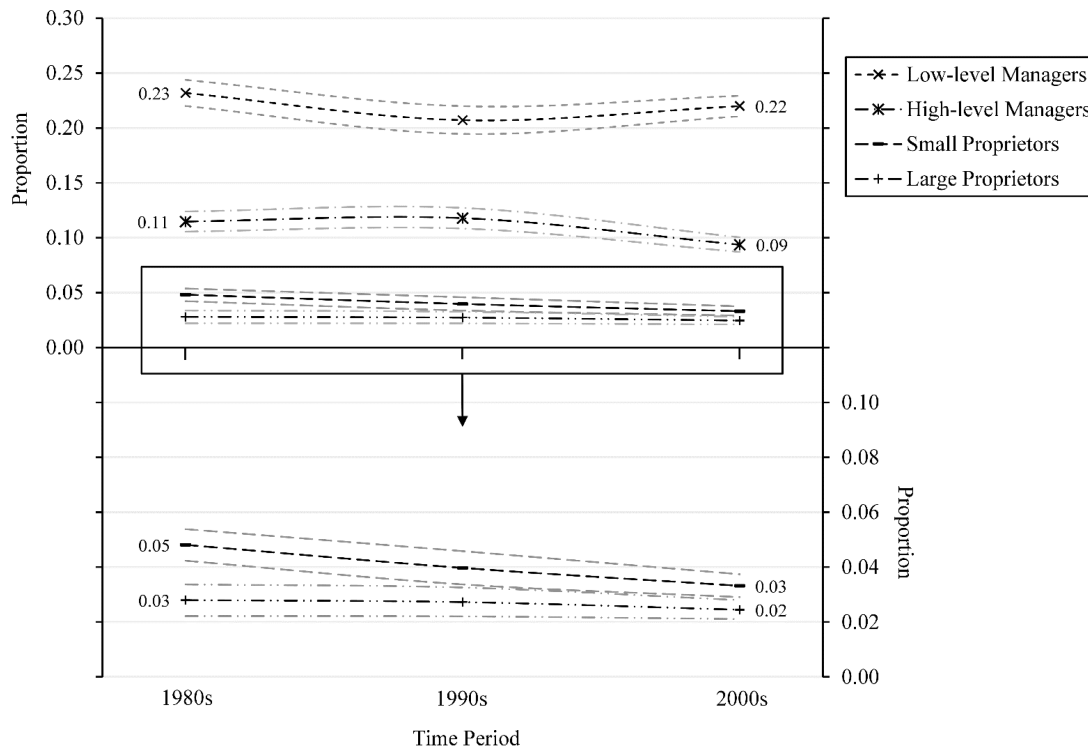
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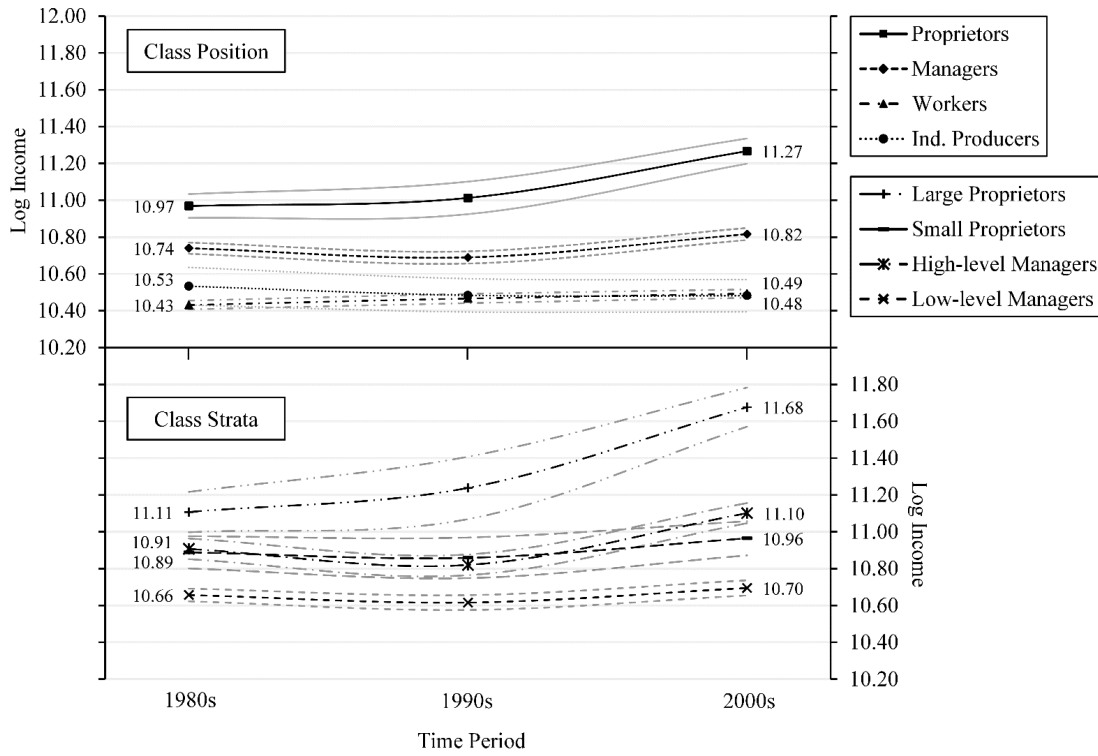
Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are combined estimates from 10 multiple imputation datasets. Point estimates and 95 percent confidence intervals are depicted in black and grey, respectively.

**Figure 1.**  
Trends in the Relative Size of Social Class Positions



Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are combined estimates from 10 multiple imputation datasets. Point estimates and 95 percent confidence intervals are depicted in black and grey, respectively.

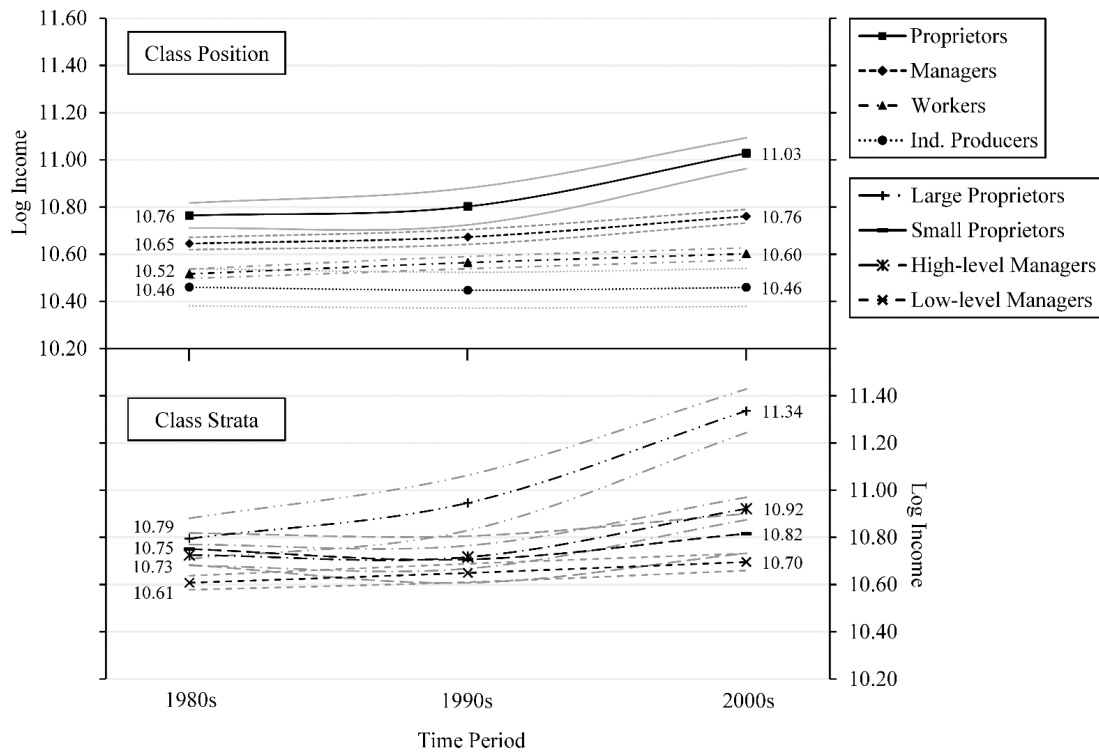
**Figure 2.**  
Trends in the Relative Size of Social Class Strata



Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are combined estimates from 10 multiple imputation datasets. Point estimates and 95 percent confidence intervals are depicted in black and grey, respectively.

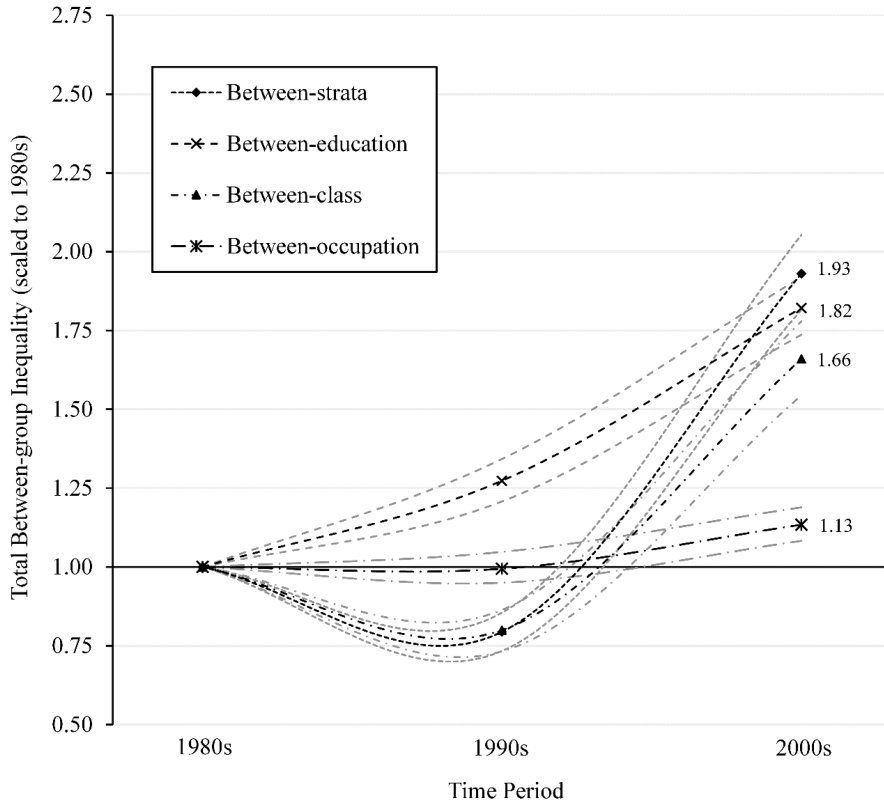
**Figure 3.**  
Unadjusted Income Trends by Social Class Position and Strata





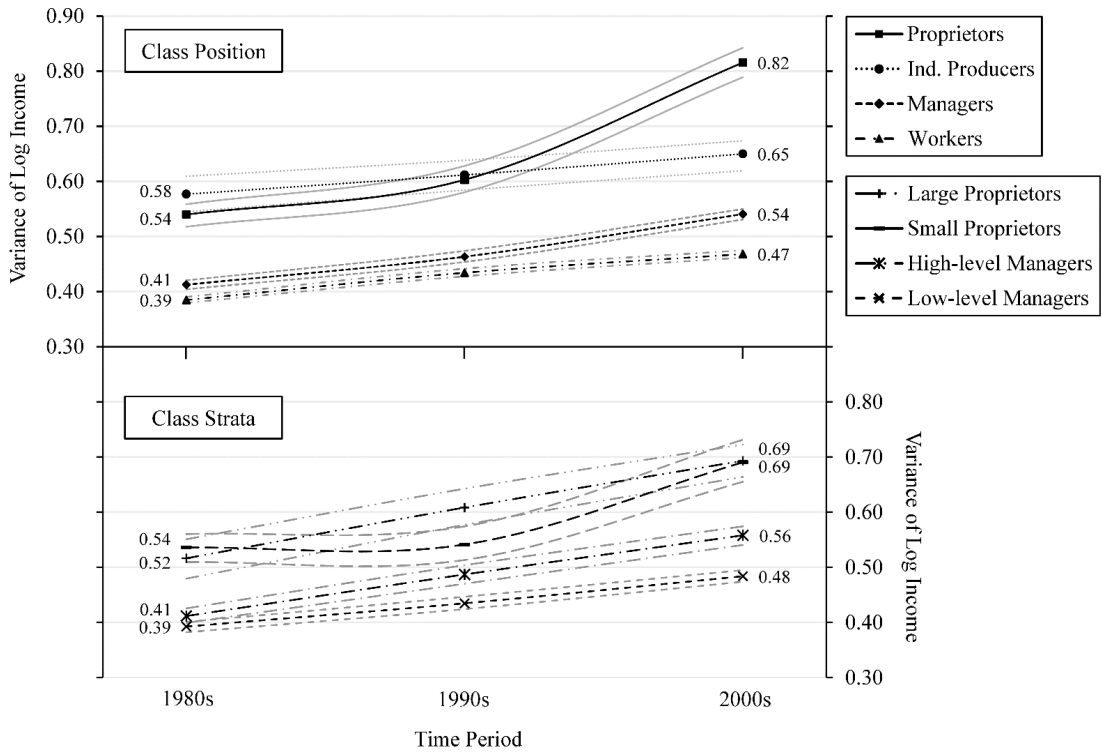
Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are combined estimates from 10 multiple imputation datasets. Point estimates and 95 percent confidence intervals are depicted in black and grey, respectively.

**Figure 4.**  
Covariate-adjusted Income Trends by Social Class Position and Strata



Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are combined estimates from 10 multiple imputation datasets. Point estimates and 95 percent confidence intervals are depicted in black and grey, respectively.

**Figure 5.**  
Trends in Between-group Income Differences



Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are combined estimates from 10 multiple imputation datasets. Point estimates and 95 percent confidence intervals are depicted in black and grey, respectively.

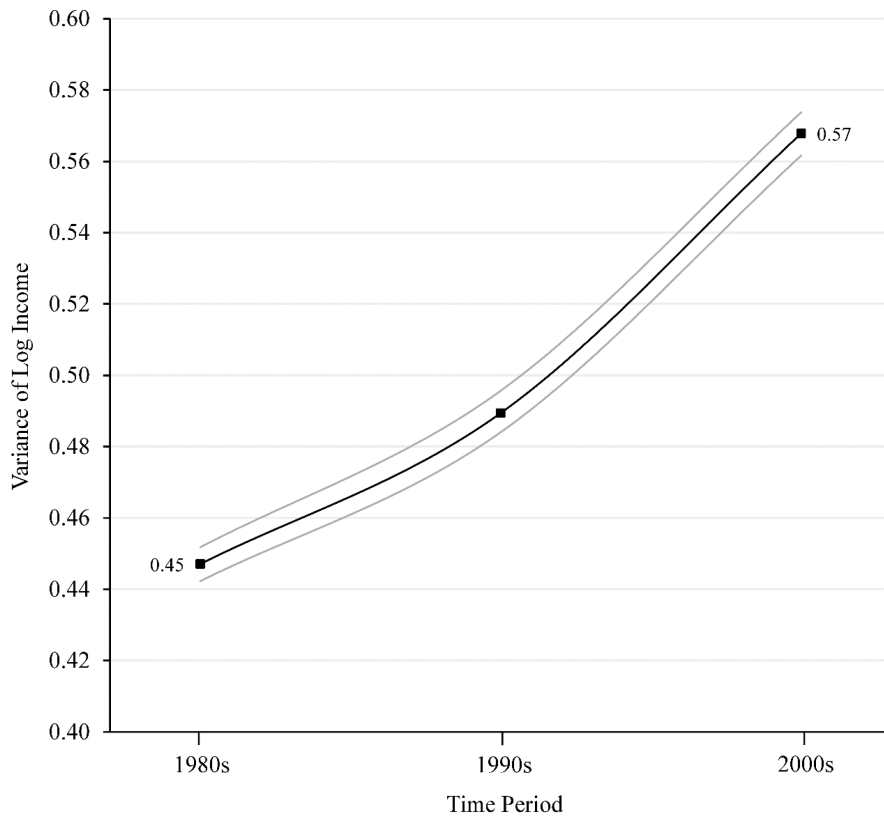
**Figure 6.**  
Trends in Within-class Income Dispersion

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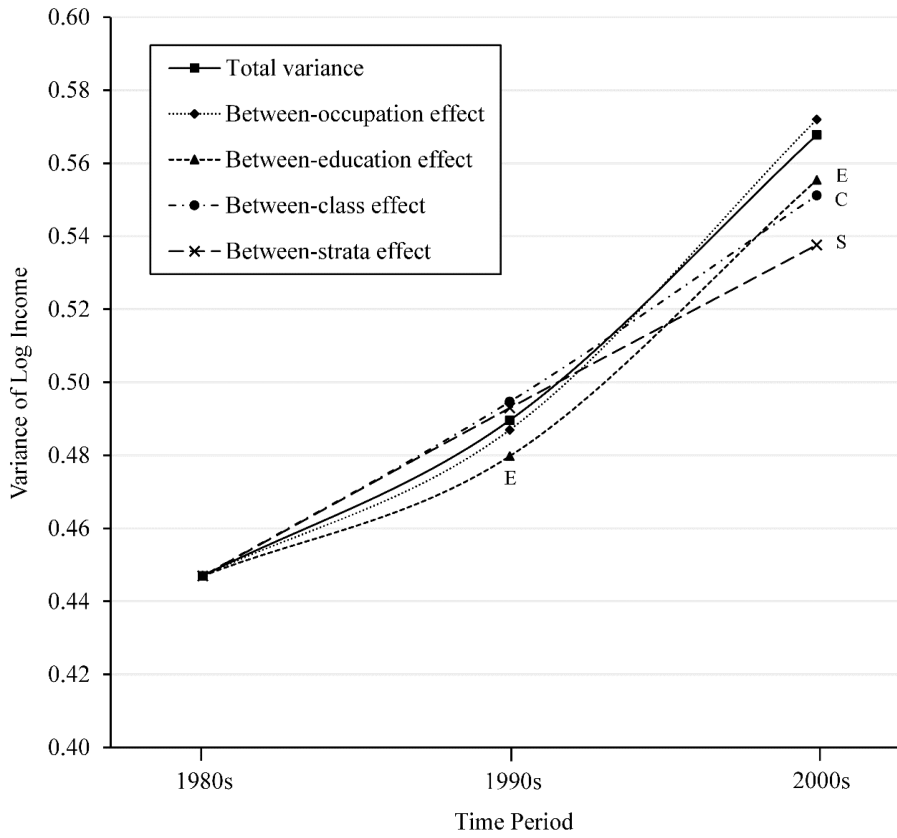
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Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are combined estimates from 10 multiple imputation datasets. Point estimates and 95 percent confidence intervals are depicted in black and grey, respectively.

**Figure 7.**  
Trends in Total Income Inequality



Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are combined estimates from 10 multiple imputation datasets. An O, E, C, or S label respectively indicates that between-occupation, education, class, or strata effects are significant at  $p < 0.05$ .

**Figure 8.**  
Counterfactual Estimates of Total Income Inequality

**Table 1**

Decomposition of Trends in Personal Income Inequality

Period	Compositional effect		Between-group effect		Within-group effect	
	Est.	95% CI	Est.	95% CI	Est.	95% CI
<i>Social Class Position</i>						
1980s to 1990s	-0.04	(-0.06, -0.01)	-0.15	(-0.24, -0.08)	1.19	(1.11, 1.28)
1980s to 2000s	-0.11	(-0.13, -0.09)	0.18	(0.15, 0.20)	0.94	(0.91, 0.96)
1990s to 2000s	-0.10	(-0.13, -0.07)	0.33	(0.29, 0.37)	0.77	(0.73, 0.81)
<i>Social Class Strata</i>						
1980s to 1990s	0.02	(-0.01, 0.06)	-0.19	(-0.28, -0.11)	1.16	(1.08, 1.25)
1980s to 2000s	-0.10	(-0.13, -0.08)	0.29	(0.26, 0.32)	0.81	(0.78, 0.84)
1990s to 2000s	-0.16	(-0.20, -0.12)	0.55	(0.50, 0.61)	0.61	(0.56, 0.65)

Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. Results are based on 10 multiple imputation datasets. Confidence intervals are based on quantiles of 500 bootstrap sample estimates.



**Table 2**

Goodness of Fit Statistics for Models of Personal Income Distribution

Model Description	F-statistic	Adj. Rsq	AIC	BIC
<i>Human capital models</i>				
(A) Human capital + demographics	N/A	0.32	39187	39571
(B) (A) + social class positions	105.91 ***	0.35	38270	38726
(C) (A) + social class strata	83.24 ***	0.36	37999	38503
<i>Aggregate occupational class models</i>				
(D) Aggregate occupational classes	N/A	0.15	44229	44445
(E) (D) + social class positions	120.37 ***	0.18	43188	43476
(F) (D) + social class strata	99.28 ***	0.20	42815	43151
<i>Disaggregate occupational class models</i>				
(G) Disaggregate occupational classes	N/A	0.23	42380	45429
(H) (G) + social class positions	93.65 ***	0.25	41557	44677
(I) (G) + social class strata	80.64 ***	0.27	41212	44381
<i>Human capital + aggregate occupational class models</i>				
(J) (A) + (D)	N/A	0.35	38111	38688
(K) (J) + social class positions	81.71 ***	0.37	37403	38052
(L) (K) + social class strata	66.77 ***	0.38	37158	<b>37854</b>
<i>Human capital + disaggregate occupational class models</i>				
(M) (A) + (G)	N/A	0.39	37300	40709
(N) (M) + social class positions	70.63 ***	0.40	36679	40160
(O) (N) + social class strata	59.66 ***	<b>0.41</b>	<b>36435</b>	39964

Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1980 to 2010 GSS waves. The F-statistic tests the hypothesis that all parameters associated with social class are equal to zero. Results are based on 10 multiple imputation datasets. All models are stratified by decade. Bold font indicates the best fitting model according to each goodness of fit statistic.

\* $p < 0.05$

\*\* $p < 0.01$ , and

\*\*\*

$p < 0.001$  for F-test that all social class parameters are equal to zero.