A Real Great Compression: Inflation and Inequality in the 1940s

Carola Frydman, Northwestern University and NBER

Raven Molloy, Federal Reserve Board

Abstract

The 1940s stand out as a unique period of substantive compression in wage inequality in the US. In their seminal paper, Goldin and Margo (1992) document a significant narrowing in nominal wage differences across the board—by education, job experience, and occupation. Yet the American economy also experienced unusually high inflation during this decade. Different types of households may have experienced different rates of inflation, causing the shift in real wage inequality to differ from the shift in nominal wage inequality. In this paper, we calculate inflation rates for different groups of households during the 1940s in order to estimate changes in the distribution of real wages. Using micro-level data from the 1935-1936 Consumer Expenditure Survey for a sample of about 2,000 urban families, we construct consumption baskets by education, occupation, and income. We compute group-specific price indexes by matching the spending shares to price indexes for specific items published in various historical reports. Differences in inflation across groups in the 1940s turn out to be small because spending shares were similar across groups. Therefore, the real wage distribution compressed by about the same amount as the nominal wage distribution. The Great Compression was "real" after all.

We thank Reeves Coursey and Sungho Park for excellent research assistance, and seminar participants at NBER Historical Labor Markets and Inequality Conference, and NYU Stern. Any opinions and conclusions expressed herein are those of the authors and do not indicate concurrence with other members of the research staff of the Federal Reserve or the Board of Governors.

1. Introduction

Most countries experienced substantial reductions in income inequality in the first part of the twentieth century, especially during the wars and the depression (Atkinson et al, 2011; Chancel and Piketty, 2021). In their seminal paper, Goldin and Margo (1992) document a "Great Compression" in the distribution of wages in the United States from 1940 to 1950 across the board—by education, job experience, and occupation. This era stands out as the only period of substantive increase in wage equality in America in almost a century.

Yet during the 1940s, the American economy also experienced an unusually large increase in prices (Rockoff, 1984). Recent research has shown that in the twenty-first century, inflation has tended to be higher for lower-income households (Jaravel 2019 and 2021, Kaplan and Schulhofer-Wohl 2017, Argente and Lee 2021). If the same were true for the 1940s, then real wage inequality would not have compressed as much as nominal wage inequality, thereby potentially changing the implications of the Great Compression in nominal wages documented by Goldin and Margo. Yet the effect of differential inflation on income inequality early in the twentieth century has been largely unexplored. In this paper, we fill this gap by calculating inflation rates for different groups of households and assessing the effects of changes in prices on the distribution of real incomes during the 1940s.

A small but growing literature studies differential inflation experiences across various socio-economic and demographic groups primarily since the 1980s. A main approach within this literature consists of levering expenditure surveys to construct group-specific spending shares. For inflation to differ across groups, there must be significant differences in expenditure shares between groups and prices must have varied significantly for these expenditure categories. For example, food inflation was particularly high in the 1940s, averaging more than 7 percent per year. In recent decades lower-income and less educated households have tended to spend a larger fraction of their budget on food. If this were also the case in the 1940s, then this item would have contributed to higher inflation for lower-income and less educated workers. Other types of goods and services might also have contributed to differences in inflation across groups. Most modern evidence based on spending shares finds at most modest differences in inflation by income.[1] Whether the same was the case historically remains an unanswered question.

The Bureau of Labor Statistics (BLS) has been conducting nationwide expenditure surveys to understand workers' spending habits since the late nineteenth century. Most of the evidence from early surveys is only available at an aggregate level in published tables. However, constructing group-specific inflation rates requires information on expenditures by household characteristics. We base our main estimates on household expenditures from the 1935-1936 Consumer Expenditure Survey (CEX), which was administered to 61,000 families by the BLS. Researchers

[1] See, among others, Michael (1979) and Hagemann (1982) for the 1970s, Garner et al. (1996) and Cage et al. (2002) for the early 1980s and early 1990s, McGranahan and Paulson (2006) for 1983-2005, and Klick and Stockburger (2021) for 2003-2018.

at the ICPSR selected samples of urban and rural families and converted the files to machine-readable form. We use the urban sample, which covers 31 cities, and further restrict the data to the 1,918 families for which we have complete information on all components of spending.

Using the micro-level data from the 1935-1936 CEX allows us to construct consumption baskets by detailed categories of education, occupation, and income. We then match a group's basket to price indexes for specific item categories from 1939 to 1949 published in various historical BLS reports. One important concern is whether spending patterns in the mid-1930s, in the midst of the Great Depression, are a reasonable approximation for consumption baskets during the 1940s. Unfortunately, there are no similar household-level data available for the 1940s. Reassuringly, we show that the spending shares we compute from the 1935-36 data are broadly similar to aggregate shares reported in national consumer expenditure surveys undertaken in 1941 and 1950.

We start by comparing spending shares for 15 broad item categories across socioeconomic groups. When we contrast households by educational attainment of the husband, for example, we find that the category with the largest difference across groups is food. Families in which the husband has less education tend to spend a larger fraction of their budget on food, which is not surprising since lower-income families spend a larger fraction of their budget on necessities (Orchard 2022). The higher spending share for food is offset by lower spending shares on automobile purchases, household operation, and reading and recreation. Despite these differences, our key finding is that spending shares are not different enough across groups to imply material differences in inflation. Even for food, the category with the most significant discrepancies in shares, the contribution to the difference in inflation across groups amounts to less than 0.2 percentage points per year.

Next we calculate group-specific inflation rates based on the 15 broad item categories. Limited variation in spending shares across groups translate into small differences in estimated inflation rates. For example, inflation for families where the husband has 8 or less years of education was only 0.2 percentage points higher per year than inflation for families where the husband has 16 or more years of education, a rather small difference given that the average inflation across all families in the sample is 5.33 percent per year. Converting these estimates to cumulative growth rates from 1939 to 1949, the price level faced by families in the least-educated group rose by 70 percent over this period, whereas the price level faced by families in the most-educated group rose by 67 percent.

It is possible, however, that focusing on a limited set of aggregate categories masks substantial variation in prices. Jaravel (2021) shows that inflation differences across groups can become significantly larger when using a larger number of more detailed item categories. By combing through historical BLS reports, we are able to construct inflation estimates for 89 specific item categories. These estimates suggest smaller differences across education groups than when using broad item categories. Inflation for domestic service was quite high during the 1940s, and the higher spending share among families with a college-educated husband on these services raises inflation differentially for these families, roughly offsetting the smaller contributions from many food items. Inflation estimates by occupation of husband are also quite similar across groups. When we split families by income, we find that inflation was 0.27 percentage points *higher* for

the top quintile than the bottom quintile, largely because of their higher spending shares on domestic service and food away from home.

Despite our best efforts, it is possible that the 89 item categories that we use to compute group-specific price indexes may still be too aggregated to elicit significant variation in prices. Our methodology assumes that all households face the same changes in prices for each item category. This is a limitation shared with modern work utilizing expenditure shares to assess inflation experiences between population groups. These studies also tend to find relatively limited variation in inflation across groups even though they are able to consider a much larger number of categories than what is available for earlier decades.[2] But estimates based on differences in expenditures across groups cannot capture other potentially important sources of heterogeneity, such as differences in product quality or differences in prices paid for the same item. A second line of research addresses these limitations by using scanner data, which can help uncover heterogeneity in consumer preferences and allow for analysis of variation in prices across consumers for the exact same good as defined by a barcode. Scanner data tends to show more significant variation in price changes across households. Evidence from the 2000s exhibits a more rapid increase in prices among lower income consumers (Jaravel, 2019; Kaplan and Schulhofer Wohl 2017), though it is possible that this pattern is partly driven by the Great Recession (Argente and Lee, 2021). An important limitation of barcode-level data on expenditures and prices is that they only cover a subset of consumer goods, and exclude many other goods and services, such as gasoline, rent or health expenditures, that constitute a significant portion of a household's consumption.[3] In our context, such data would have missed expenditures on domestic service, which was a large contributor to price increases for high-income families. Nevertheless, evidence from scanner data points to the importance of variation in product quality across different types of households. Our ability to address this issue directly is fairly limited, but we provide some evidence based on automobiles suggesting that differences in product quality across education groups were fairly small.

In sum, our main finding is that inflation experiences were rather similar across groups during the 1940s. Thus, it is not surprising that utilizing group-specific inflation rates to adjust Goldin and Margo's estimates of relative wages by education, experience, and occupation has an almost negligible effect on those estimates. We show that the significant narrowing of wage inequality during the 1940s was slightly *more* pronounced after taking differences in inflation across groups into account. Thus, America experienced a "Great Compression" in real wages as well as nominal wages during this era.

Our paper contributes to the literature on the historical trends in income inequality by considering the importance of differential inflation across groups, an issue that has been largely ignored both in the historical and modern context. Given the difficulties of constructing consistent estimates of group-specific inflation over time, most of the work studying income and wealth inequality over the long-run or in a historical context is unadjusted by inflation (see, among others, Goldin and Margo, 1992; Piketty and Saez, 2003; Goldin and Katz, 2007). Notably, Williamson (1977) studies the impact of prices on inequality for certain periods during

[2] For example, Klick and Stockburger (2021) have price data for 243 items across 32 distinct geographic areas.
[3] Jaravel (2019) shows that scanner data cover products that account for only about 15 percent of total expenditures measured in the CEX surveys.

the twentieth century using similar consumer expenditure data, albeit based only on a small number of item categories. Another important exception is Moretti (2013), who finds that accounting for inflation differences between people with a college education and people with a high school education leads to a material reduction in the relative wage increase across groups since the 1980s.[4] By contrast, we assess differences in real wage inequality in a period of high inflation. While adjusting for inflation is unlikely to make much of an impact at times when inflation is low, it has the potential to be a more significant factor during inflationary periods.

Our paper also adds to our understanding of the Great Compression. Given the uniqueness and magnitude of the narrowing of the wage distribution during the 1940s, it is surprising that the groundbreaking work by Goldin and Margo (1992) has not led to more widespread efforts to understand this period. Related work has focused on further evaluating differences across other groups of workers (Margo and Finegan, 2002; Margo, 1995; Frydman and Molloy, 2012), assessing the role of unions (Frydman and Molloy, 2012; Collins and Niemesh, 2019), and reassessing the basic facts by exploiting the more comprehensive Census data that are now available to researchers (Jarowski and Niemesh, 2018). We add to this literature by showing that this compression did not result from differences in inflation experiences across groups.

We also contribute to a small but growing literature studying the heterogeneity in inflation experiences across socioeconomic and demographic groups. The findings in this literature vary by methodology—specifically, whether papers use expenditure shares matched to published price indexes or scanner data to calculate inflation for specific items—and period of analysis (see Jaravel, 2021, for a review of this literature). Most of this work has focused on modern (post-1970s) data, and therefore largely ignores periods of high inflation. We know much less about inflation patterns earlier in the century. Our paper takes a first step to fill in this gap by focusing in the 1940s, a period when the American economy experienced a rapid increase in prices. At a time when inflation is again relatively high, and debates on who will pay its costs have resurfaced, it becomes ever more important to learn from past experience.

2. Data sources and sample

2.1 Consumer Expenditure Surveys over time

Since the late 19th century, the BLS has been conducting expenditure surveys to understand the spending patterns of American households. The content, design and geographic coverage of these survey instruments has varied significantly over time (Jacobs and Shipp, 1990). The first two surveys, in. 1888-91 and 1901, for example, had limited coverage and focused primarily on blue-collar workers' spending patterns. Starting with the third survey, conducted between 1917 and 1919, these data became the basis to estimate weights for the Consumer Price Index.

A fourth survey focusing on urban wage and clerical workers was conducted during the Great Depression. The BLS collaborated with other government agencies to pursue the first-ever

[4] See also Costa (1999), who uses historical consumer expenditure surveys to estimate the trend in inequality in recreational expenditures from 1888 to 1991 to get insights into the evolution of living standards for poor and rich households over time.

nationwide survey of consumer purchases in 1935-1936 to study family consumption patterns of about 300,000 urban and rural families.[5] This survey was titled the Study of Consumer Purchases in the United States, but since later surveys were titled "Consumer Expenditure Survey" we refer to this survey as the 1935-36 CEX. A subset of 61,000 families—25,000 urban and 36,000 rural—were then selected for a series of extended questionnaires. The urban sample is the main basis of our analysis. We do not use the rural sample because the price data collected by the BLS only cover urban areas, and price changes could easily have differed in rural areas.

To be included in the 1935-1936 CEX, native-born non-farm families must have included a husband and wife and had at least one wage earner in a clerical, professional or business occupation. Also, families with income below a nominal cutoff (which varied by city size) and those that received relief were excluded, as were recently-married couples and families residing in hotels, institutions and lodging houses. In the 1990s, researchers at the ICPSR selected samples of urban and rural families and converted the files to machine-readable form. We use the urban sample, which covers 2,480 families in 31 cities.[6] Two thirds of the sample completed the survey in 1936, while one third completed the survey in 1935. The amounts of spending reported generally refer to the prior 12 months, except for a module on food expenditures which records detailed categories of spending for the prior week.

While data on most categories of spending are available for all households in the ICPSR sample, the variable reflecting total spending on furniture is missing. We are able to get information on furniture spending from a detailed module that covers spending on furniture, furnishing and household equipment. However, this module is only available for 77 percent of families. Moreover, detailed food expenditure data are only available for the 70 percent of families that filled out a supplement covering food expenditures in the prior week. Therefore, our main sample is based on the 1,743 urban families for which we have complete information on all components of spending. This smaller sample has a similar distribution of income, husband education and occupation, and location as the full sample of families. Results are similar when we use the full sample of families and omit the information from the food and furniture modules (results not shown).

In their sampling of the micro data, the ICPSR researchers decided to make it representative of the broader CEX survey rather than reweighting the data to be representative of the US population. Therefore, we start by showing that the families in the ICPSR sample are indeed representative of the original 1935-1936 CEX. Table 1 compares expenditure shares by item category in our sample to published estimates from several BLS reports. In columns 1 and 2, we compare expenditure shares in our sample with estimates from a BLS report based on the full 1935-36 survey, which reports shares for urban families with income above $500 and earnings between $300 and $2000.[7] When we restrict our sample to these levels of income and earnings (in column 1), we find that the spending shares for each category are quite similar except for

[5] The surveys were conducted in 30 states, covering a total of 51 cities, 140 villages, and 66 farm counties.
[6] See the documentation for ICPSR collection 8908 for more details on the survey and digitalization process, available at https://www.icpsr.umich.edu/web/ICPSR/studies/8908
[7] "Money Disbursements of Wage Earners and Clerical Workers 1934-36" by Faith M Williams and Alice C Hanson, BLS Bulletin No. 638. Roughly half of the ICPSR sample fits the income and earnings restrictions used in the published report. One quarter of the ICPSR sample is excluded because at least one family member had earnings of more than $2,000, and one quarter is excluded because no family members earned at least $300.

spending on food, which is a few percentage points lower in our sample, and spending on transportation and entertainment, which is a few percentage points higher. Despite these differences, it seems that our main micro data are a representative sample of the full 1935-36 survey.

Since our strategy is to use 1935-36 expenditure shares to study differential price inflation from 1940 to 1950, one important concern is that spending patterns during the Great Depression may not be a good proxy for consumption shares in the 1940s. While no comprehensive survey was run during the 1940s, a much smaller project covering only 1,300 urban families was undertaken in 1941-42 to obtain information on expenditures separately for all of 1941 and for the first three months of 1942. The family-level records from this effort, which we refer to as the 1941 survey, are not available in machine-readable form and the published tables in BLS reports do not report spending differences by education or occupation. Consequently, we cannot use this survey to calculate inflation for these subgroups. But we can use the aggregate published data to compare spending shares in the 1930s with the early 1940s. In columns 3 and 4 of Table 1, we compare our sample of urban families with spending shares in 1941 from the 1941 survey.[8] We find that spending shares were broadly similar in 1935-36 and 1941, although spending on 'housing and utilities' and recreation was slightly higher in our sample, while spending on clothing and food was a bit lower.[9] Therefore it seems that spending patterns in 1935-36 were fairly similar to those seen in the beginning of the 1940s.

The war may have substantially altered consumption patterns. Many goods were in short supply, and a variety of price and quantity controls affected the types of goods that could be purchased. Consumption patterns may have shifted again after the war once most of the controls were lifted (Higgs, 1999). Unfortunately, there were no large-scale surveys of family expenditures during the 1940s. The next large-scale survey was conducted in 1950, covering 12 thousand urban families. While the family-level data from this survey are not available in machine-readable form, detailed tables were published in a BLS report.[10] In column (5) we report spending shares from this survey.

From 1935-36 to 1950, spending on housing had fallen somewhat, while spending on food, transportation, and furniture, furnishings and household equipment had increased. The decline in housing expenditures was concentrated among renters (see Appendix Table 1). Rent growth during the 1940s was much lower than inflation for most other item categories, which can probably explain why rental expenditures became a smaller fraction of total spending. A significant increase in homeownership over this 14-year period also contributed to the decline in

[8] "Family Spending and Saving in Wartime" BLS Bulletin 822, 1945. For consistency with the earlier survey, we exclude the value of items received "in kind". For consistency with the 1935-36 sample we report data from Table 5 of the report, which includes only families with 2 or more persons.

[9] To be consistent with the definitions used in each BLS report, to compare with the published 1935-36 data we define housing expenditures for owner-occupants as their estimated rental value of their home, while to compare with the published 1941 data we define housing expenditures for owner-occupants as their expenditures for repairs, replacements, insurance, mortgage interest, taxes, refinancing charges and special assessments. In Section 4.1 we present more information on these two methods of measuring housing expenditures.

[10] "Study of Consumer Expenditures, Incomes and Savings; statistical tables: Urban US 1950" tabulated by the Bureau of Labor Statistics, US Dept of Labor, for the Wharton School of Finance and Commerce, University of Pennsylvania.

the housing expenditure share, since housing expenditures tend to be a smaller fraction of total spending for owners than for renters. However, we estimate that the rise in homeownership reduced the aggregate housing expenditure share by only 0.7 percentage points, about 25 percent of the observed decline in the aggregate (see Appendix Table 1). Turning to other expenditure categories, the increase in spending on food and transportation may have been because price inflation for these categories was relatively high. Despite these differences, Table 1 shows that spending patterns were fairly similar on aggregate at the beginning and end of the decade, which supports our decision to use the 1935-36 spending shares to calculate inflation for the entire decade. This assumption seems reasonable since the main focus of this paper is to study inflation over the entire decade, rather than year-to-year variation in prices within the 1940s. We return to this issue in Section 4.4, where we analyze how spending shares shifted from 1935-36 to 1950 by education of the husband. And in Section 3.2 we describe the evolution of price controls and rationing and their potential for temporary shifts in spending patterns within the decade.

2.2 Representativeness of the 1935-36 CEX micro data

Since our analysis will focus on comparing spending shares and inflation estimates across various socioeconomic groups, it is important to understand whether these data are representative of the population. Though the survey was designed to cover a wide array of areas and families, it was not constructed as a probability sample of the U.S. population at that time. In Appendix Table 2, we compare the demographic and socioeconomic characteristics of our sample to data on urban families from the 1940 Census.[11]

We find that the distributions of husband's age, race and housing tenure are fairly similar in the two data sources. However, the husbands of the families in the ICPSR sample tend to have more schooling and are more likely to be in a white-collar occupation. Correspondingly, mean and median earnings (adjusted to 1936 dollars using the headline CPI) are somewhat higher in the ICPSR sample than in the 1940 Census. This difference is likely attributable to three reasons. One is that the 1935-36 CEX did not sample families receiving relief, therefore omitting many families at the lower end of the income distribution. In addition, the 1935-36 CEX aimed to only cover families with at least one worker in a clerical, professional or business occupation, and therefore did not include as many blue-collar workers. A third reason may be that the geographic distribution of the ICPSR sample differs from the 1940 Census: the ICPSR sample has a larger fraction of families in midsize cities relative to very large metropolises or very small cities, and it also has a larger fraction of families in the South and West.[12]

[11] The 1935-36 CEX recorded the age, educational attainment, race and occupation of the husband. The occupation is reported in text form, so we use string cleaning and machine learning techniques to match the text strings to 1950 occupation codes. See Appendix A for details. The 1940 data are from the 1% 1940 IPUMS sample (Ruggles et al. 2022).

[12] The ICPSR sample includes data from both metropolises included in the 1935-36 CEX (New York and Chicago) as well as all of the large and mid-size cities in the full survey. However, it covers only about half of the small cities that were included in the full survey. At the same time, its coverage of New York City is much lower than we would expect based on the 1940 Census data. Since coverage is low for the smallest and largest cities, implications for socioeconomic characteristics of the families are unclear. However, when we calculate average wages, median wages, and the distribution of educational attainment in the 1940 Census using the geographic distribution of the

In Appendix Table 3, we compare the distribution of income in the ICPSR sample to the distribution of income among the 18.5 thousand families included in the full 1935-36 survey. The latter distribution was reported in Appendix B of a report by the National Resources Committee titled "Consumer Expenditures in the United States, Estimates for 1935-36." The distribution of income in the ICPSR sample is quite similar to the distribution in the full sample, suggesting that the geographic differences between the ICPSR sample and the 1940 Census are attributable to the geographic coverage of the full 1935-36 survey rather than an issue with the ICPSR's sample.

2.3 Price data

We obtain price data for specific item categories from BLS price indexes published in several sources. Many of the indexes for broad item categories are available electronically at the BLS website. To obtain prices for more detailed item categories, we hand-collect information from various published sources. Indexes for 41 detailed food items are from the 1967 Handbook of Labor Statistics, Table 109. Indexes for many other detailed item categories are from a 1962 report titled "Price Indexes for Selected Items and Groups 1935-61."[13] Other sources include the 1967 Handbook of Labor Statistics and BLS Bulletin 966. Appendix Table 4 provides a list of sources for the broad item categories, while Appendix Table 5 provides a list of sources for detailed item categories.

For three of the detailed item categories (those from BLS Bulletin 966), we only have price indexes through 1947. In these cases we estimate the growth rate from 1947 to 1949 using the growth rate of a broader category from 1947 to 1949 multiplied by the ratio of the 1939-47 growth rate for the specific category to the 1939-47 ratio of the broader category.

3. Results

3.1 Heterogeneity in Consumption Patterns

We begin our analysis by studying differences in consumption patterns across household types. As a starting point, we focus on differences by education since education was one of the main sources of heterogeneity studied by Goldin and Margo (1992). Table 2 reports spending shares for each major item category by educational attainment of the husband.

For most item categories, spending shares are fairly similar across groups. The category exhibiting the largest difference by education levels is food. Families in which the husband has less education tend to spend a larger fraction of their budget on food, which is not surprising since lower-income families tend to spend a larger fraction of their budget on necessities (Orchard 2022). The higher spending share for food is offset by lower spending shares on automobile purchases, household operation (which includes domestic services, laundry services, and cleaning supplies), and reading and recreation. Their lower spending on automobile

ICPSR CEX sample, we can't explain much of the difference in these outcomes between the 1940 Census and the ICPSR sample.

[13] http://onlinebooks.library.upenn.edu/webbin/book/lookupid?key=ha001887682

purchases reflects a lower propensity to purchase a car: in this sample only 16 percent of the families in the lowest education group had purchased a car in the survey year, compared with 25 percent in the highest education group. Conditional on having purchased a car in the schedule year, the price of the car was about 15 percent of total household spending for all five groups.[14]

Housing expenditures in 1935-36 were a much smaller fraction of total expenditures than in recent decades (McGranahan and Paulson, 2006). For our baseline results, we follow the CPI methodology in defining housing expenditures as rent for renter households and the owner's estimate of rent for their home for owner-occupied households.[15] In Section 4.1 we show that results are similar when we use owner expenditures on mortgage interest, taxes, insurance, etc. instead of the owner's estimate of rent.

Appendix Table 6 reports spending shares for each quintile of the income distribution and by occupation. As with educational attainment, differences across groups are the most pronounced for the food category. Housing expenditure shares differ more across income groups than across education or occupation groups, with higher-income families having lower expenditure shares. Clothing expenditure shares also differ more across income groups, with higher-income families having higher expenditure shares. In general, differences between blue-collar and white-collar families are minor, consistent with a study conducted by the National Resources Committee, which found that spending patterns across occupation groups were similar in the 1935-36 survey data (NRC 1939, page 17).

3.2 Price Changes from 1939 to 1949

In the last column of Table 2, we report the price change that we use for each broad item category. (See Appendix Table 4 for the exact mapping between categories of spending and price indexes.) We focus on the price changes from 1939 to 1949 since our ultimate goal is to assess implications for changes in income inequality between the 1940 Census and 1950 Census, and incomes reported in the Census reflect incomes in the prior year.

Price changes from 1939 to 1949 were largest for food. Since families with less-educated husbands spent a larger fraction of their budget on food, we would expect this component of spending to boost general inflation for this group. However, this boost is modest: families in the lowest category of educational attainment spent 8.4 percentage points more of their budget on food than families in the highest category, but food inflation was only 2.3 percentage points higher than the growth rate of the published CPI for all items, which was 5.5 percent on average over the decade. Thus, differences in food spending across households should have raised inflation for the least-educated group by only about 0.2 percentage points on average over this 10-year period relative to the most-educated group. Categories with relatively low price growth include rent, electricity, medical care and tobacco. Spending shares for these groups were fairly similar across categories, so we would not expect them to create a material difference in general inflation across groups.

[14] Following the BLS methodology for the CPI we subtract any trade-in amounts from the purchase price of the car.
[15] We exclude lodging away from home because we do not have a price index for this category. Spending in this category was 1.7 percent of total spending, on average.

The 1940s was one of the periods of most elevated inflation rates in documented American history, in no small part because of the war effort. To combat inflation, the federal government enacted price (and wage) controls. The coverage and strength of these policies, as well as rationing of goods, varied substantially over time (Rockoff, 1984). Though there were some discussions to introduce price controls as early as 1939, price controls only started in earnest in May 1940. This early phase, which lasted until April 1942, was relatively permissive. Many goods and services were excluded from controls altogether, and while some controls were formal, others were based on informal agreements. The enactment of the General Maximum Price Regulation in 1942 led to a four-year period of much broader and stricter controls. While the initial set of rules were relatively ineffective at curbing inflation, the "Hold-the-Line" order passed in April 1943 essentially prohibited most price increases.

The strong enforcement of this order resulted in moderate inflation until the controls began to relax in February 1946. Prices began to increase at that time, and inflation picked up even further in late 1946, when most price controls were removed. By November of that year, only controls for sugar, rice and rent remained. Of these, only rent controls persisted long after the war ended. The majority of the population lived in areas under federal rent control in 1946. Though they were introduced as an emergency measure related to the war, rent controls were not relaxed until late in the 1940s, and they continued to exist in many places into the 1950s (Fetter, 2016). Inflation moved down in 1948 and 1949 as many of the supply constraints that had pushed up inflation during the war eased. Because much of inflation during the 1940s was attributable to war-related constraints, the patterns we document in this paper may not be more broadly representative of changes in prices during other periods of US history.

3.3 Group-Specific Inflation Estimates

We calculate headline inflation for each socioeconomic group as the weighted average of price changes for each item category, where the weights are the spending shares calculated using the 1935-36 family-level spending data. Thus, these inflation estimates assume that all households face the same changes in prices for each item category. Research using data from the 2000s has found that price changes do vary across households within these broad item categories (Jaravel, 2019; Argente and Lee, 2021; Kaplan and Schulhofer Wohl, 2017). We will return to this issue below.

It is important to note that our methodology does not allow for any change in spending shares over time. Therefore it is similar in spirit to a Laspeyres index, which uses spending shares in time period t as weights for price changes from period t to t+1.[16] The Consumer Price Index also uses a Laspeyres-type method. In Table 1, we showed that aggregate spending shares were fairly similar in 1935-36 and 1950, suggesting that inflation estimates would be similar if we used expenditure shares from 1950. In Section 4.3, we will show that our results are indeed similar when we calculate alternate inflation estimates that use spending shares by education of husband from the 1950 survey. This evidence suggests that keeping the consumption basket fixed over time is unlikely to significantly bias our main results.

[16] The difference is that we do not use shares from time t but shares from a few years prior to time t.

Table 3 presents estimates of headline inflation by education, occupation and income group.[17] Column (3) reports inflation estimates based on the 15 broad item categories covered in Table 2. The average across all families is 5.28 percent per year, only slightly lower than the 5.52 percent growth rate of the published CPI index.[18] The inflation estimates are quite similar across groups, with inflation tending to be slightly higher for families with lower income and for which the husband has less education or works in a blue-collar occupation.

Figure 1 illustrates why the estimates are similar across groups. In this figure, each dot reflects the contribution of an item category to headline inflation. Specifically, the x-axis shows the difference in expenditure shares between families in the highest and lowest education groups, and the y-axis shows the price change of that item relative to headline inflation. The category of food reduces inflation of the more-educated group relative to the less-educated group because families with a more-educated husband have a lower food expenditure share and food inflation was higher than average. For the other item categories with large relative price differentials (shelter and electricity), expenditure shares were not that different across groups. Other item categories had relatively small relative price differentials as well as relatively small differences in expenditure shares.

Research using data from the 2000s has found that using a larger number of more detailed item categories can generate larger differences in inflation across income groups. Jaravel (2019) finds that inflation differences between the top and bottom quartiles of income are almost 4.7 times larger when he studies 256 distinct categories than when he uses only 22 spending items, based on CEX-CPI data from 2004 to 2015. Similarly, he finds more variation in inflation by income using barcode-level information from scanner data than when aggregating information to product groups.

The level of detail can matter if price trends differ within broad item categories and if different types of households tend to purchase items with different price trends. For example, consider the category of clothing. If the prices of high-quality fashion-brand clothing increase at a different rate than the prices of low-quality clothing, inflation would differ for families depending on the type of clothing that they tend to purchase. But an inflation estimate based only on the average price change for all clothing would not capture these differences and would therefore understate inflation inequality.

We are able to expand our analysis to 89 item categories: 44 categories of food, 5 categories of spending on household operations, 7 categories of personal care, 9 categories of medical care, 10 categories of spending on transportation, and 3 categories of tobacco-related expenses. We are also able to separate spending on movies and newspapers from spending in other reading and recreation, and we are able to separate furniture from household furniture, furnishings and

[17] Note that we define income quintiles based on the full sample of 2480 families. Thus, there are not exactly 20 percent of families in each income group when we restrict the sample to those households with complete spending data.

[18] One reason for this difference is that prior to 1952, the BLS used a shelter expenditure weight equal to zero for owner-occupants (since they did not have cash expenditures on rent). Because owner-occupants have a positive expenditure share in our analysis and rent growth was lower than for other goods and services, our estimate is lower than the published estimate. If we use a shelter expenditure weight equal to zero for owner-occupants, we calculate an aggregate inflation rate of 5.57 percent per year.

equipment.[19] The full list of items is in Appendix Table 5. The categories are detailed enough that one might expect spending differences across groups for many of these items. For example, one might expect differences across groups in the propensity to purchase various types of fresh fruits and vegetables versus canned or processed fruits and vegetables. Other item categories where one might expect differences across groups include different types or cuts of meat, spending on domestic service, and spending on beauty salon services.

Column 4 of Table 3 shows that even using these much more granular data, inflation estimates remain very similar across groups. The largest difference across groups is a 0.27 percentage point gap between the top and bottom income quintiles.[20] It turns out that the spending shares tend to be fairly similar, even for items that one might expect to differ more across groups such as movie admissions, beauty salon services, and cigars. To illustrate this fact, Figure 2 shows the contributions to headline inflation by detailed items. The figure shows these contributions for high-income families relative to low-income families, since the difference across income groups is larger than differences across education or occupation categories. While many items have large relative price differences, most of these items have fairly small differences in expenditure shares.

Our results differ materially from Jaravel (2019) in that inflation increases by more for high-income, high-education families when we use a larger number of item categories. By contrast, in his results using more item categories increased inflation more for low-income households. In the 1940s, inflation increases when a finer level of disaggregation is used primarily because higher-income households have larger expenditure shares on domestic service and food away from home, and these items had high relative price inflation during that decade.[21]

We have focused on groups defined by income, education and occupation because these groups are the most relevant to the Goldin and Margo (1992) analysis, but other household characteristics are of relevance as well. When we group families by race, average inflation was 5.42 percent for White families and 5.27 percent for Black families, a smaller difference than the gap between the top and bottom income quintiles.[22]

Thus far our results have focused on the difference in average inflation for each group. It is possible that these averages mask important heterogeneity within groups. To investigate this possibility, we calculate inflation for each family using its expenditure shares. Panel A of Figure 3 plots the distribution of inflation rates for families in the highest and lowest income groups.

[19] We are not able to create detailed categories of spending for clothing because the ICPSR data sample did not record these detailed expenditures, even though they were included in the survey. The dataset includes variables for these detailed categories, but the values are equal to zero for all observations. Nor are we able to create detailed categories of spending on furniture or furnishings because the ICPSR sample is too small to measure purchases of specific durable goods accurately. We are unable to create detailed categories of recreation other than movie admissions because we do not have price indexes for other items in this category.

[20] The difference across groups becomes larger when we look at the extreme tails. Average inflation for the bottom 5% of the income distribution was 5.16, while average inflation for the top 5% was 5.74. However, these estimates are based only on about 75 families per group and are therefore not estimated very precisely.

[21] The BLS did not publish a price index for food away from home in the 1940s, so we use the aggregate food index for this category.

[22] For this analysis, we limit the sample to cities where Black families were included in the ICPSR sample: Atlanta GA, Columbus OH and Mobile AL.

Although a Kolmogorov-Smirnov test rejects that the two distributions are the same, there is a fair amount of overlap, especially at the top of the distribution. For example, 12 percent of families with low income have an inflation rate more than 0.5 percentage points above 5.3 (the mean of the aggregate distribution), and 11 percent of families with high income have this high inflation rate. There is a larger difference between groups at the lower tail: 17 percent of families with low income have an inflation rate more than 0.5 percentage points below 5.3, while only 7 percent of families with high income experience an inflation rate this low.

Panel B of Figure 3 shows similar results across education groups. While average inflation is the lowest for the middle education group (heads with 12 years of schooling), the distribution is statistically indistinguishable from the distribution of inflation for the highest education group. Both of these distributions are statistically different from the distribution of inflation for families in lowest education group, which is clearly shifted to the right. The lowest education group has 4 percent fewer families with low inflation and 4 percent more families with high inflation relative to the other two groups shown.

Another advantage of calculating family-specific inflation rates is that we can test how different the means of the distributions are. While we can reject that the means of the highest and lowest education groups are the same, we can also reject that they are more than 0.2 percentage points apart. Similarly, we can reject that the means of the highest and lowest income groups are the same, and we can also reject that the means are more than 0.3 percentage points apart.

In sum, the differences in means across groups are small relative to the heterogeneity in family-specific inflation rates, similar to Kaplan and Schulhofer-Wohl (2017) and Hobijn and Legakos (2005). These differences are also small relative to the average inflation rate during this time period. For example, the difference between the highest and lowest income groups is only one twentieth of the average inflation rate. Converting these estimates to cumulative growth rates from 1939 to 1949, the price level faced by families in the lowest income group rose by 67 percent over this period, whereas the price level faced by families in the highest income group rose by 71 percent.

As discussed above, inflation was much higher in some years during the 1940s than others. In Figure 4 we show annual inflation estimates by income and education group, which we calculate using annual price changes for the 89 items and expenditure shares from 1935-36.[23] The baseline result that average inflation from 1939 to 1949 was higher for higher income groups is mostly driven by the war years. During that time, the price increases for domestic service and reading and recreation were much higher than average, and these items have a larger weight for wealthier families. By contrast, inflation was higher for lower income, less educated families in 1947 due to large price increases for a variety of food items such as beef, pork, flour and sweets.

One issue with using 1935-36 expenditure patterns to measure inflation throughout the 1940s is that expenditure patterns could have shifted materially during the war. In Section 2.1, we showed

[23] Because vehicle production was shifted to military vehicles during World War II, automobile prices are not available for 1942 to 1946. For these years we set the expenditure share for auto purchases to zero and re-normalize the spending shares for all other categories. This assumption is fairly extreme since some families could have purchased used cars during this period, but we do not have data on used car prices during this period.

that expenditures in 1935-36 were fairly similar to those in 1941 and 1950. This is reassuring when the objective is to calculate inflation inequality on average for the entire decade, but it is not informative of year-to-year changes in consumption patterns across groups within the decade. While no large-scale expenditure surveys were conducted during this time, the BLS did survey a handful of cities in each year from 1944 to 1948. Published aggregates from these surveys suggest that expenditures on food and clothing increased during the war, while expenditures on automobiles and reading and recreation decreased (see Appendix Table 8). Expenditure shares had mostly returned to their pre-war patterns by 1948. Because these expenditure surveys were small and there is only limited published information on how shares differed across types of households, it is difficult to assess the implications for inflation inequality. Therefore, we view the patterns in Figure 4 as only suggestive and focus on the average inflation rate from 1939 to 1949.

3.4 Revisiting Goldin and Margo's estimates

Given the relatively small differences in inflationary experiences across groups we documented thus far, our analysis suggests that changes in nominal and real relative incomes must have been fairly similar. For completeness, we utilize the estimates of inflation over the entire 1939-1949 period to assess their implications for changes in relative wages between the 1940 and 1950 Census. The first two columns of Table 4 replicate estimates of relative wages by education and occupation as reported in Tables 2 and 3 of Goldin and Margo (1992). The relative wages by education are reported separately for different groups of labor market experience because wages rise with experience and less-educated workers tend to have more labor market experience. The third column reports relative inflation for each group. Unfortunately, due to the small sample size of the ICPSR data, we do not have sufficient information to construct reliable estimates for all categories of labor market experience in the Goldin and Margo paper. When possible, we use our estimates of group-specific inflation to adjust the nominal relative wages. Specifically, the fourth column presents relative wages in 1950 adjusted for relative inflation over the decade—i.e. relative real wages.

The estimates of relative real wages are very similar to the estimates of relative nominal wages. For example, relative nominal wages of workers with a college education and 16 to 20 years of labor market experience fell from 1.65 times the wage of a worker with a high school education and the same amount of labor market experience in 1940 to 1.42 times in 1950. After adjusting for the fact that inflation was slightly higher for families with a more-educated husband, real wages in 1950 were 1.40 times the real wage of the less-educated group. Thus, the narrowing of wage inequality was generally more pronounced after taking differences in inflation across groups into account, but only slightly.

4. Robustness

We have found that inflation differed little across types of families from 1940 to 1950, despite the high rate of inflation during this period and the material differences in inflation across broad categories of item types. In this section we explore the robustness of this baseline result to various alternative methods.

4.1 Housing expenditures

Housing is one of the main components of household spending, amounting to about 15 percent of spending for the average household in the sample. It is also one of the most difficult categories to measure appropriately. Ideally, a measure of inflation faced by consumers would use the price of shelter for its housing component because shelter is the service consumed by the residents living in a home. Estimating the price of shelter is relatively straightforward for renters because it can be measured using rents. However, the price of shelter is not observed for owner-occupants. In our baseline results, the expenditure share for owner-occupants is based on the rent that the owners think they would have to pay if they were to rent the home where they reside. This is the same way that expenditure shares are calculated for owner-occupants in the modern CPI. To measure changes in the price of shelter, the modern CPI uses an index called "owners' equivalent rent," which is based on rents paid by tenants.[24] Since this index is not available for the 1940s, in our baseline results we use a price index for rent of primary residence to measure the change in the price of shelter for owner occupants as well as for renters.

In short, our baseline results are based on two assumptions: that the owners' estimate of the rent for their home is a good proxy for their cost of shelter, and that the growth in the price of shelter for owner occupants was the same as the growth in the price of shelter for renters. Since 40 percent of families in the 1935-36 survey were owner-occupants, our baseline estimates could be biased by a substantial amount if either of these assumptions are flawed. Importantly, since homeownership rates differed across groups, as shown in column 1 of Table 5, any bias imparted by these assumptions would also differ across groups.

An alternative way to measure the cost of shelter for owner-occupants is to add up all of their direct expenditures related to owning the home: mortgage interest, repair and replacement costs, property taxes, insurance, special assessments, and mortgage refinancing charges.[25] Column 3 of Table 5 reports housing expenditure shares using this direct measure for owners and rent for renters. For comparison, Column 2 reports housing expenditure shares from our baseline specification. The direct ownership expenditures tend to be lower than the owner's estimate of the rental value of their home, causing the housing expenditure share to be lower when this alternate measure is used. However, as with the owner's estimate of rental value there is relatively little variation across groups. We find similar patterns when we calculate housing expenditures using both methods for homeowners only, shown in columns 4 and 5 of the table.

In order to assess the assumption that the change in the price of shelter was the same for owner-occupants as it was for renters, a natural strategy would be to calculate our own estimate of owners' equivalent rent and compare it to the index for tenants' rent. The BLS calculates owners' equivalent rent as a weighted average of rent growth for different Census block groups, with locations where owner-occupants are more likely to live getting a larger weight. We cannot

[24] Under their current methodology, the BLS calculates an index for owners' equivalent rent by adjusting rent changes of tenant-occupied units for differences in housing characteristics between tenant-occupied and owner-occupied units. They also subtract utilities from rental payments when calculating owners' equivalent rent, which they do not do for tenants' rent.

[25] In keeping with the definitions used in the 1941 and 1950 surveys, we exclude expenditures on mortgage principal and structural additions because they are considered investment.

follow this strategy because there is no detailed data on rent growth for different neighborhoods in the 1940s. Instead, we calculate the change in direct ownership costs.[26] Specifically, using a BLS report published in 1956 that summarizes results from the 1950 consumer expenditure survey, we calculate average expenditures for owner-occupied dwellings as the average expenditures on owner-occupied dwellings among all families of 2 or more persons divided by the fraction of families reporting expenditures for owner-occupied dwellings.[27] We find that owner expenses were about $385 in 1950, whereas they were $219 in the 1935-36 survey. Therefore owner expenditures increased by 4.13 percent per year over this roughly 14-year period. When we do a similar calculation for renters we find that renter expenses increased by 2.31 percent per year, quite similar to the growth rate of the CPI for tenants' rent of 2.22 percent per year over this period. If we assume that the ratio of the growth rate for owners' expenses to the growth rate for rent was the same from 1939 to 1949 as it was from 1936 to 1950, we find that owner expenditures increased by 3.45 percent per year from 1939 to 1949. Column 6 of Table 5 shows estimates of headline inflation using this estimate for the change in the price of shelter for owner occupants instead of rent growth. This alternate inflation measure also uses the direct owner expenditures instead of the owner's estimate of rent. The alternate inflation estimate is higher than our baseline estimate for two reasons: the increase in owner costs was larger than the increase in rent, and the smaller housing expenditure share for owners puts less weight on an item category for which price growth was relatively low. Nevertheless, differences across groups remain quite small since the alternate housing expenditure shares do not differ much across groups.

Another way in which our baseline analysis has over-simplified the housing component of inflation is that we use a national rent index for all households. If rent growth varied materially across locations and different types of families lived in different locations, then our baseline analysis would be missing an important source of inflation heterogeneity.

To assess this possibility, we need data on rent growth for various locations. We use data reported in BLS Bulletin 1165, which reports indexes from 1940 to 1952 for 34 cities. Most of the cities in the 1935-36 CEX are not included in this report so we cannot include city-specific rent measures directly in our inflation calculation. Instead, we use the city-specific indexes for New York City and Chicago and calculate population-weighted average rent growth for the four Census regions excluding these two cities.[28] Table 6 reports the distribution of families by education of husband across these 6 locations and average rent growth in each location.[29] Because the geographic distribution of families in the 1935-36 CEX does not line up well with the 1940 Census, the table shows the geographic distribution of families from the 1940 Census.

---

[26] Another strategy could have been to calculate the change in the owner's estimate of rent, but the 1950 survey did not ask owners to estimate the rental value of their home.

[27] "Study of Consumer Expenditures, Incomes and Savings; Statistical tables: Urban U.S.-1950" tabulated by the Bureau of Labor Statistics, U.S. Dept. of Labor, for the Wharton School of Finance and Commerce, University of Pennsylvania. Volume 4, Table 2. Expenditures are reported separately for nine classes of city size and location, so we take a weighted average across groups using the number of owner-occupied families in each group as weights.

[28] We separate New York City and Chicago because otherwise they would have a very large weight in the region averages, whereas most of the families in the 1935-36 CEX do not live in these two cities.

[29] We include one additional city (St. Louis, MO) that is not included in Bulletin 1165 but for which the rent index posted on the BLS website extends back to 1940.

We find noticeable differences in rent growth across locations. Rent only rose by 1 percent per year in New York City, whereas it rose 3 percent per year in Chicago. Rent growth in the rest of the Northeast was higher than in New York City, but still lower than in the other three regions. Although the geographic distribution of families was fairly similar across these locations, families with a husband with 8 or less years of education were more likely to live in New York City and less likely to live in the West than other families.

The bottom two rows of the table report estimates of the shelter component of inflation. These estimates use the geographic distribution of families in the 1940 Census and average housing expenditure shares by location and family type from the 1935-36 CEX. Using location-specific rent growth reduces shelter inflation for the least-educated group because of the heavier concentration of families in New York City, where rent growth was relatively low. However, this effect is small, only 0.04 percentage points. Effects on other groups are even smaller. Therefore, allowing for regional heterogeneity in rent growth does not lead to material differences in inflation across groups. In Appendix Table 7, we show that the distribution of families by income quintile was also quite similar across these six locations.

The cities included in BLS Bulletin 1165 were among the largest in the country. Only four had a population smaller than 100,000 (Manchester NH, Portland ME, Savannah GA and Mobile AL). By contrast, nearly half of the families in the 1935-36 lived in cities with a population smaller than 100,000, and rent growth could have been different in these smaller cities. We are not aware of any rent indexes for small cities, so instead we examine this possibility by comparing average rental expenditures by city size in the 1935-36 CEX and the 1950 CEX. Specifically, the report covering expenditure data from the 1950 CEX includes rent expenditures for cities in the North, South and West with population over 50,000 and those with population less than 50,000.[30] When we calculate the increase in rent expenditures between the two survey periods, the increases seen in small cities were fairly similar to the larger cities in the same region (results not shown).

4.2 Car Prices

Another significant item where we may be underestimating heterogeneity across households is automobile purchases. Our baseline estimates assumed that car prices increased by the same amount for all households, regardless of the characteristics of the car they purchased, or whether they purchased a new or used vehicle. However, among families in the 1935-36 CEX that purchased a car in the schedule year and had only one car, 66 percent of those with a husband with 8th grade education or less bought a used car, while only 19 percent of those with a husband with 16 or more years of education bought a used car.[31] Thus there appears to be substantial differences across groups in the propensity to buy a new versus used car.

[30] In this report, some cities in the Midwest are included in the North, while the remaining cities are included in the West.

[31] For this analysis we must limit to families with only one car because for families with multiple cars we cannot distinguish which car was purchased in the schedule year. Among families that purchased a car in the schedule year, 8 percent owned more than one car.

The BLS does not publish a price index for used cars for the 1940s, so in our baseline estimates we used the new automobile price index for all car purchases.[32] The only aggregated data on used car prices that we have been able to find are from a figure reporting average used car prices by age of car from the 1950 volume of Automobile Facts and Figures (page 14). Based on estimating values from the figure, we calculate that the prices of used cars rose by 12, 12, 14 and 25 percent (annual rate) for cars that were 1 year old, 2 years old, 3 years old, and 7 years old, respectively.[33] These increases are much larger than the increase in the BLS price index for new cars, which was 6.7 percent per year from 1939 to 1949. However, the increase in the price of a used car of a given age will reflect the quality difference between cars produced in different years as well as pure price changes, so it is important to keep in mind that these estimates overstate the pure price change for used cars. Nevertheless, these calculations suggest that price increases for used cars were likely larger than price increases for new cars. This factor would tend to increase inflation for lower income or lower education groups relative to our baseline estimates, although the exact magnitude is difficult to gauge with the limited data available.

Even conditional on buying a new or used car, different types of households may purchase different makes of cars, or different models within a particular car make. In the 1935-36 survey, we can identify 10 different car makes with enough purchases to reliably estimate an average price of a new car.[34] Table 7 shows the distribution of families by socioeconomic group that purchased low-priced cars, medium-priced cars and high-priced cars. There is a modest amount of sorting by group, with 79 percent of families in the lowest education group purchasing a low-priced car make, compared with only 57 percent of families in the highest education group. Since we also know the price paid by each family, we can examine the price paid given the car make for 5 makes for which we have enough observations. We find little difference across groups in prices paid given the make of the car. Specifically, when we regress the log of the car's purchase price on indicators for make and education of the husband, the coefficients on the family type indicators are small and insignificantly different from zero.

It is difficult to assess the implications of different types of cars purchased for inflation since we do not have much data on changes in car prices in the 1940s. The BLS Bulletin 966 includes price indexes for three car makes: Ford, Chevrolet, Plymouth. All of these makes are in the "low priced" category in Table 7—their average prices in the 1935-36 CEX were $700, $730 and $770 respectively. The BLS price indexes for each of these car makes rose at similar rates from 1939 to 1948—at 7.0, 5.7 and 6.6 percent, respectively. We don't know whether more expensive car makes might have undergone materially different price trends over the 1940s.

In summary, the biggest differences in car purchase patterns across socioeconomic groups (conditional on purchasing a car at all) appears to be whether the family chose to buy a new or used car. It seems likely that used car prices rose by more than new car prices, which would have boosted inflation for families with lower incomes and husbands with less education and in blue collar occupations. If we assume that used car prices rose by 10 percent per year, which is likely an overestimate given the data on used car prices cited above and the assumption that auto

[32] The series for used car and truck purchases starts in December 1952.
[33] The figure does not show car prices in 1949 for cars that are 4 to 6 years old because passenger cars were not produced during World War II.
[34] For this analysis we use the full sample of 2450 families since we want to have the largest possible sample size.

quality increased over time, then our estimate of the difference in inflation between the lowest and highest income groups only decreases from 0.27 percentage point to 0.25 percentage point.

4.3 Shifts in Spending Patterns from 1935-36 to 1950

Our baseline results used spending patterns in 1935-36 to weight each category of spending. We have already shown above that aggregate spending patterns were fairly similar in 1941 and 1950 as they were in 1935-36. However, these similarities might mask important shifts in spending patterns for particular socioeconomic groups. In this section we calculate spending shares by education of husband from the 1950 consumer spending survey to assess this possibility.

Table 8 reports expenditure shares by education of husband from the 1950 consumer spending survey. We draw these estimates from the tables published in the 1956 BLS report mentioned above.[35] Estimates are reported separately for nine combinations of city size and location, so we average across these categories using the number of families in each category as weights. It is important to note a few distinctions across surveys that may affect comparability. Unlike the 1935-36 CEX, which focused solely on families, the 1950 survey included single consumers as well as families with at least two people. Also, the report uses a slightly different set of education categories, as it combines those with 12 years of education with those with 9 to 11 years, and it includes those with 16 years of education with the 13 to 15 category rather than the 17+ category. The reported categories of spending are also slightly different from the ones that we used for our baseline results: electricity is included with other utilities, and expenses for automobile operation like insurance and maintenance are included with gasoline.[36]

Despite the slightly different categories of families and items, the patterns across groups are quite similar to those found in the 1935-36 survey. The item category with the largest difference across groups is still food, with a 9 percentage point difference between the families with the most-educated husbands and the least-educated husbands. When we calculate expenditure shares in the 1935-36 survey using the same education categories as the 1950 survey, we find a difference in food expenditure shares across groups of 9.6 percentage points. One might have expected food expenditure shares to have risen more for less-educated families since food price inflation was higher than average and food is a necessity, but this was not the case. The food expenditure share for families with 8 years or less increased by 1.8 percentage points from 1935-36 to 1950, while for those with 17 years or more it increased by 2.5 percentage points.

The last row of the table reports an estimate of headline inflation using the 1950 expenditure shares as weights. The results are quite similar to our baseline results using the 15 broad item categories, with inflation for the lowest education category being 0.26 percentage points higher than inflation for the highest education category. When we calculate inflation using these same education groups but expenditure shares from the 1935-36 survey, we find a difference of 0.29 percentage points.[37] It is worth noting that the inflation estimates that use the 1950 spending

[35] Most estimates are from Volume 2, Table 7. We supplement these estimates with detail on transportation expenditures from Volume 10, Table 7.
[36] We still use the price index for motor fuel for this category since the majority of expenses in this category will be gasoline.
[37] For this estimate we use the item categories from our baseline estimates.

patterns are higher than those that use the 1935-36 spending patterns because more weight is put on the categories of food and furniture/furnishing/household equipment, and price inflation was higher than average for these categories.

5. Conclusions

The 1940s were a unique period of significant narrowing in the wage distribution in America. They were also a decade of high inflation rates, yet the potential impact of unequal inflationary experiences on the distribution of income during this era has been unexplored so far.

In this paper, we combine detailed data on expenditures by socioeconomic group with price changes by item category to estimate group-specific inflation rates from 1940 to 1950. We find that differences in spending patterns across groups were small for most item categories, leading to similar estimated inflation rates for all groups. The differences across groups ranged between 0.1 and 0.25 percentage point per year, only about one twentieth of the average inflation rate over this period. Differences across groups were also small relative to the large compression in wage inequality from 1940 to 1950 documented by Goldin and Margo (1992). We conclude that the compression in nominal wages documented by Goldin and Margo (1992) across the board—by education, income, and occupation—is essentially unchanged when one considers real wages.

Although our results are robust to various alternate assumptions and specifications, the sparseness of historical data is an impediment to measuring inflation inequality with as much specificity as research using modern data. These studies tend to find larger differences across groups when using price and expenditure data for very detailed item categories. Despite our efforts to include as much detailed data as available, it is still possible that our estimates may understate the true differences in inflation across groups.

Keeping these concerns in mind, it is also possible that the supply constraints imposed by the wartime economy on the variety of available goods and price controls may have served to limit differences in consumption patterns and inflationary experiences across groups. Whether our findings are specific to the war period, or more broadly representative of the early twentieth century economy is a remaining open question. The variation in consumption patterns across groups may have been limited by a narrower choice set of consumption goods in the early twentieth century than it is today. Rising incomes, increasing returns to scale, and technological changes that allow for highly customized products may have contributed to increas product variety over time, by favoring innovation and entry for high-end products (Jaravel, 2019 and also Jaravel, 2021 for a review of this literature). Thus, inflation may have a larger impact on the income distribution today than it did in the past. Assessing this possibility empirically is a promising avenue for future research.

References

Argente, David and Munseob Lee. 2021. Cost of Living Inequality During the Great Recession, *Journal of the European Economic Association* 19 (2): 913–952

Atkinson, Anthony B., Thomas Piketty, and Emmanuel Saez. 2011. "Top Incomes in the Long Run of History." *Journal of Economic Literature*, 49 (1): 3-71.

Cage, Robert A., Thesia I. Garner, and Javier Ruiz-Castillo. 2002. Constructing Household Specific Consumer Price Indexes: An Analysis of Different Techniques and Methods. *Bureau of Labor Statistics* Working Paper 354

Chancel, Lucas and Thomas Piketty. 2021. Global Income Inequality, 1820–2020: the Persistence and Mutation of Extreme Inequality, *Journal of the European Economic Association*, 19 (6): 3025–62

Collins, William J. and Gregory T. Niemesh. 2019. Unions and the Great Compression of wage inequality in the US at mid-century: evidence from local labour markets. *The Economic History Review*, 72(2): 691-715

Costa, Dora. L. 1999. American Living Standards: Evidence from Recreational Expenditures. National Bureau of Economic Research Working Paper No. 7148.

Fetter, Daniel K. 2016. The Home Front: Rent Control and the Rapid Wartime Increase in Home Ownership. *The Journal of Economic History,* 76 (4): 1001-43

Frydman, Carola and Raven Molloy. 2012. Pay Cuts for the Boss: Executive Compensation in the 1940s. *The Journal of Economic History.* 72(1): 225-51

Garner, Thesia I., David S. Johnson, and Mary F. Kokoski. 1996. An experimental Consumer Price Index for the poor. *Monthly Labor Review* September: 32-42

Goldin Claudia and Lawrence F. Katz. 2007. Long-Run Changes in the U.S. Wage Structure: Narrowing, Widening, Polarizing. *Brookings Papers on Economic Activity* No. 2.

Goldin, Claudia and Robert A. Margo. 1992. The Great Compression: The Wage Structure in the United States at Mid- Century. *The Quarterly Journal of Economics*, *107* (1), 1–34.

Hagemann, Robert P. 1982. The Variability of Inflation Rates Across Household Types. *Journal of Money, Credit and Banking,* 14 (1): 494-510

Higgs, Robert. 1999. From Central Planning to the Market: The American Transition, 1945-1947. *The Journal of Economic History,* 59 (3): 600-23

Hobijn, Bart and David Lagakos. 2005. “Inflation Inequality in the United States.” *Review of Income and Wealth 51(4)*: 581-606.

Jaravel, Xavier. 2019. The Unequal Gains from Product Innovations: Evidence from the U.S. Retail Sector. *The Quarterly Journal of Economics*, 134 (2): 715–783

Jaravel, Xavier. 2021. Inflation Inequality: Measurement, Causes, and Policy Implications. *Annual Review of Economics* 13 (1): 599-629

Jaworski, Taylor and Gregory T. Niemesh. 2018. Revisiting the Great Compression: Wage inequality in the United States, 1940–1960. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 51 (1): 39-48

Jacobs, Eva and Stephanie Shipp. 1990. How family spending has changed in the U.S. *Monthly Labor Review*, March: 20-27.

Kaplan, Greg and Sam Schulhofer-Wohl. 2017. Inflation at the household level. *Journal of Monetary Economics* 91:19–38

Klick, Josh and Anya Stockburger. 2021. Experimental CPI for lower and higher income households. *Bureau of Labor Statistics* Working Paper 537

Margo, Robert A. 1995. Explaining Black-White Wage Convergence, 1940–1950. *ILR Review*, *48*(3): 470–481.

Margo, Robert A. and T. Aldrich Finegan. 2002. The Great Compression of the 1940s: The Public versus the Private Sector. *Explorations in Economic History, 39(2): 183-203*

McGranahan, Leslie and Anna Paulson. 2006. *Constructing the Chicago Fed Income Based Economic Index – Consumer Price Index: Inflation Experiences by Demographic Group: 1983-2005.* Federal Reserve Bank of Chicago Working Paper 2005-20

Michael, Robert T. 1979. Variation Across Households in the Rate of Inflation. *Journal of Money, Credit and Banking,* 11 (1): 32-46

Moretti, Enrico. 2013. "Real Wage Inequality." *American Economic Journal: Applied Economics*, 5 (1): 65-103.

Orchard, Jacob. 2022. Cyclical Demand Shifts and Cost of Living Inequality. Working Paper.

Piketty, Thomas and Emmanuel Saez. 2003. Income Inequality in the United States, 1913–1998. *The Quarterly Journal of Economics*, 118 (1): 1–41

Rockoff, Hugh. 1984. Drastic Measures: A History of Wage and Price Controls in the United States (Studies in Economic History and Policy: USA in the Twentieth Century). Cambridge: Cambridge University Press.

United States Department of Labor. Bureau of Labor Statistics. Cost of Living Division, United States Department of Agriculture. Bureau of Home Economics. Economics Division, United States National Resources Committee. Consumption Research Staff. Industrial Section, United States Central Statistical Board, and United States Works Progress Administration. Study of Consumer Purchases in the United States, 1935-1936. Inter-university Consortium for Political and Social Research [distributor], 2009-06-29.

Williamson, Jeffrey G. 1977. "'Strategic' Wage Goods, Prices, and Inequality." American Economic Review, 67(2): 29-41

Table 1
Comparison of Expenditure Shares in ICPSR Sample of 1935-36 CEX to Published BLS Reports

	Household Income>500 300<=Earnings<=2000		All Urban Families		
	ICPSR Sample	1935-36 Published	ICPSR Sample	1941 Published	1950 Published
	(1)	(2)	(3)	(4)	(5)
Food	31.2	34.6	30.0	30.8	31.1
Housing and utilities	25.4	25.0	20.4	18.5	15.1
Housing	18.6	17.6	14.1	--	11.1
Utilities	6.8	7.4	6.3	--	4.0
Household operation	4.7	3.9	5.6	5.2	4.7
Furniture, furnishing, equipment	3.2	4.1	3.6	5.3	7.1
Clothing	9.7	10.9	10.9	12.1	11.5
Transportation	9.9	8.5	11.4	12.1	13.8
Automobile related	--	--	10.0	9.7	12.1
Other transportation	--	--	1.3	2.3	1.7
Personal care	2.2	2.0	2.2	2.2	2.2
Medical care	4.7	4.0	5.0	4.7	5.2
Entertainment	7.4	5.6	8.3	7.5	7.2
Recreation	--	--	5.4	4.4	4.5
Reading			1.1	1.0	0.9
Tobacco	--	--	1.9	2.1	1.8
Education	0.6	0.5	1.2	0.8	0.6
Other	1.0	0.9	1.4	0.8	1.5

Note. Columns 1 and 3 authors' calculations from ICPSR collection 8908. Column 2 from BLS Bulletin 638 "Money Disbursements of Wage Earners and Clerical Workers 1934-36." Column 4 from BLS Bulletin 822 "Family Spending and Saving in Wartime." Column 5 author calculations from 1956 BLS report "Study of Consumer Expenditures Incomes and Savings: Statistical Tables Urban US 1950", Table 2 in Volumes 2, 5, 9 and 10.

Table 2
Expenditure Shares by Education of Husband in 1935-36

	8 years or less	9 to 11 years	12 years	13 to 15 years	16 years or more	Price Change 1939-49 (annual rate)
Food	32.7	30.3	28.2	27.1	23.7	7.8
Housing	17.5	17.0	18.3	16.9	16.7	1.9
Electricity	1.9	1.9	2.0	1.8	1.8	-0.6
Other utilities	5.1	4.3	4.1	3.7	3.6	6.7
Household operation	4.1	5.3	5.2	6.2	7.1	3.9
Furniture, furnishing, equip.	3.0	4.0	3.4	4.3	3.7	6.4
Clothing	10.0	10.2	10.6	10.7	10.9	6.6
Automobile purchase	3.2	4.3	4.0	3.8	5.2	6.7
Gasoline	2.6	3.1	3.4	3.6	3.4	4.0
Other transportation	3.4	3.8	3.8	4.2	4.2	3.3
Personal care	2.2	2.2	2.1	2.1	2.0	5.4
Medical care	4.9	4.6	4.7	4.4	4.5	3.7
Reading & recreation	5.1	5.6	6.3	6.7	7.5	5.2
Tobacco	2.1	1.9	1.7	1.6	1.5	3.9
Other	2.0	1.5	2.2	2.9	4.3	3.9
Share of sample	39.1	18.8	17.5	10.7	13.9	--

Note. Housing expenditures are rent for renters and the owner's estimate of rent for owners. Other expenditures include education and occupation-related expenses. The price index for "other" excludes food, housing, apparel & upkeep, transportation, medical care, personal care and reading & recreation. The price index for housing is the index for rent of primary residence.

Table 3
Inflation by Group, 1939-1949

	Number of Observations	Percent of Observations	Inflation (percent change, annual rate) 15 categories	89 categories
All families	1743	100	5.28	5.33
Education of husband				
<=8 years	682	39.1	5.39	5.34
9 to 11 years	327	18.8	5.35	5.38
12 years	305	17.5	5.22	5.26
13 to 15 years	187	10.7	5.23	5.35
>=16 years	242	13.9	5.14	5.34
Occupation				
Blue collar	646	37.6	5.39	5.35
White collar	1072	62.4	5.24	5.37
Craft	271	15.8	5.40	5.36
Operative	195	11.4	5.36	5.35
Laborer	57	3.3	5.48	5.35
Service	123	7.2	5.35	5.32
Professional	628	36.6	5.21	5.40
Clerical	444	25.8	5.30	5.33
Household Income				
Bottom quintile	386	22.1	5.37	5.24
Second quintile	366	21.0	5.34	5.30
Middle quintile	337	19.3	5.30	5.28
Fourth quintile	340	19.5	5.29	5.33
Top quintile	314	18.0	5.21	5.51

Table 4
Relative Wages in 1940 and 1950

	Relative Nominal Wage		Relative Inflation	Relative Real Wage
	1940	1950		1950
College – High School				
1 to 5 years experience	1.742	1.357	--	--
6 to 10 years experience	1.728	1.369	1.000	1.369
11 to 15 years experience	1.777	1.461	1.005	1.454
16 to 20 years experience	1.652	1.421	1.019	1.395
21 to 25 years experience	1.408	1.449	1.013	1.430
26 to 30 years experience	1.475	1.466	0.994	1.475
31 to 35 years experience	1.393	1.367	1.023	1.336
36 to 40 years experience	1.357	1.189	--	--
Some College – High School				
1 to 5 years experience	1.195	1.029	--	--
6 to 10 years experience	1.184	1.151	0.988	1.165
11 to 15 years experience	1.219	1.147	1.005	1.141
16 to 20 years experience	1.316	1.215	1.010	1.203
21 to 25 years experience	1.164	1.276	1.008	1.266
26 to 30 years experience	1.126	1.063	0.992	1.072
31 to 35 years experience	0.989	1.084	1.041	1.041
36 to 40 years experience	0.999	1.204	--	--
High School – 8^{th} Grade				
1 to 5 years experience	1.376	1.442	--	--
6 to 10 years experience	1.463	1.322	--	--
11 to 15 years experience	1.377	1.299	0.978	1.328
16 to 20 years experience	1.385	1.267	0.992	1.277
21 to 25 years experience	1.371	1.221	0.990	1.233
26 to 30 years experience	1.427	1.286	1.014	1.268
31 to 35 years experience	1.354	1.250	0.978	1.278
36 to 40 years experience	1.283	1.326	0.978	1.356
White Collar – Average	1.256	1.177	0.999	1.178
Blue Collar – Average	0.860	0.891	1.001	0.890
Professional	1.474	1.254	1.003	1.250
Clerical	0.988	0.940	0.997	0.943
Craft	1.039	1.023	1.000	1.023
Operative	0.856	0.861	0.999	0.862
Laborer	0.630	0.750	0.999	0.751
Service	0.737	0.779	0.996	0.782

Table 5
Housing Expenditure Shares and Inflation by Socioeconomic Group

	Percent Owners	Housing Expenditure Share: All Households, Using Rent for All (Baseline)	Housing Expenditure Share: All Households, Using Owner Expenses	Housing Expenditure Share: Owners Only, Using Rent	Housing Expenditure Share: Owners Only, Using Owner Expenses	Headline Inflation using Owner Expenses
	(1)	(2)	(3)	(4)	(5)	(6)
Education of head						
<=8 years	40.2	17.5	14.2	20.3	11.0	5.55
9 to 11 years	33.0	17.0	14.4	20.1	11.4	5.55
12 years	38.4	18.3	14.7	20.5	10.2	5.47
13 to 15 years	38.0	16.9	13.9	19.8	11.2	5.53
>=16 years	47.5	16.7	13.3	18.5	10.7	5.56
Occupation						
Blue collar	37.6	17.6	14.6	20.7	11.9	5.54
White collar	40.2	17.6	14.3	20.1	10.9	5.58
Craft	37.6	17.5	14.4	20.8	11.7	5.56
Operative	37.9	17.2	14.6	20.2	12.3	5.53
Laborer	38.6	18.6	15.0	22.5	12.0	5.57
Service	36.6	18.2	15.2	20.6	11.3	5.51
Professional	44.3	17.3	13.6	19.5	10.4	5.62
Clerical	34.5	18.1	15.5	20.4	11.5	5.50
Household income						
Bottom quintile	30.1	21.0	17.3	25.6	11.2	5.45
Second quintile	34.2	19.2	15.8	22.2	10.6	5.49
Middle quintile	40.4	18.1	14.8	19.7	10.5	5.48
Fourth quintile	43.8	17.4	14.1	19.3	10.9	5.54
Top quintile	50.6	15.7	12.8	16.1	9.8	5.71

Table 6
Distribution of Families by Region and Education of Husband and Implications for Inflation

	8 years or less	9 to 11 years	12 years	13 to 15 years	16 years or more	Rent Growth 1940-49
Percent of families by region:						
New York City	21.3	13.6	12.3	12.5	17.5	1.03
Northeast Region ex. NYC	22.0	21.0	18.0	13.9	17.5	2.04
Chicago	8.3	7.1	6.7	6.7	6.1	2.98
Midwest Region ex. Chicago	25.5	28.2	28.5	26.2	25.1	2.36
South	14.8	17.2	17.4	21.4	19.5	2.65
West	8.1	13.0	17.0	19.3	14.4	2.75
Shelter component of inflation						
Using aggregate rent growth	0.40	0.39	0.39	0.38	0.37	--
Using regional rent growth	0.37	0.39	0.39	0.40	0.38	--

Table 7
New Car Purchases by Price of Car Make

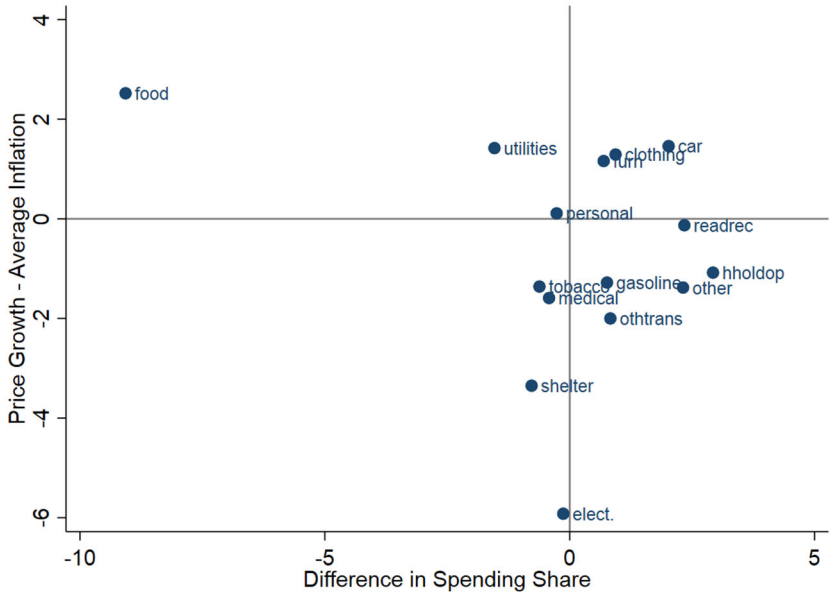
	$900 or less (Ford, Chevrolet, Plymouth, Terraplane, Pontiac)	$900 to $1100 (Dodge, Oldsmobile)	More than $1100 (Chrysler, Buick, Studebaker)
Education of husband			
<=8 years	79.2	13.2	7.5
9 to 11 years	79.5	13.6	6.8
12 years	64.8	20.4	14.8
13 to 15 years	58.8	29.4	11.8
>=16 years	57.3	20.0	22.7
Occupation			
Blue collar	80.4	13.7	5.9
White collar	64.1	19.9	16.0
Craft	74.1	18.5	7.4
Operative	86.7	6.7	6.7
Laborer	100	0	0
Service	8.75	12.5	0
Professional	59.1	19.1	21.7
Clerical	78.0	22.0	0.0
Household Income			
Bottom quintile	71.4	14.3	14.3
Second quintile	88.9	11.1	0
Middle quintile	87.9	9.1	3.0
Fourth quintile	76.7	16.7	6.7
Top quintile	49.5	25.3	25.3

Table 8
Expenditure Shares in 1950 by Education of Husband in 1950

	8 years or less	9 to 12 years	13 to 16 years	17 years or more	Price Change 1939-49 (annual rate)
Food	34.4	30.8	28.2	25.5	7.8
Housing	10.5	11.7	12.5	12.8	1.9
Utilities	4.8	3.8	3.3	3.2	3.3
Household operation	3.9	4.5	6.0	7.5	3.9
Furniture, furnishing and equip.	6.4	7.0	7.2	8.4	6.4
Clothing	11.2	11.4	11.9	11.8	6.6
Automobile purchase	6.1	7.0	7.1	6.5	6.7
Automobile operation	4.5	5.5	5.3	5.0	4.0
Other transportation	2.0	1.7	1.7	1.7	3.3
Personal care	2.3	2.3	2.2	1.9	5.4
Medical care	5.3	5.2	5.1	4.9	3.7
Reading, recreation & education	5.3	6.0	6.5	7.6	5.2
Tobacco	2.0	1.8	1.4	1.1	3.9
Other	1.5	1.3	1.5	2.0	3.9
Headline inflation	5.73	5.63	5.55	5.47	--
using 1935-36 spending patterns	5.43	5.32	5.28	5.14	--

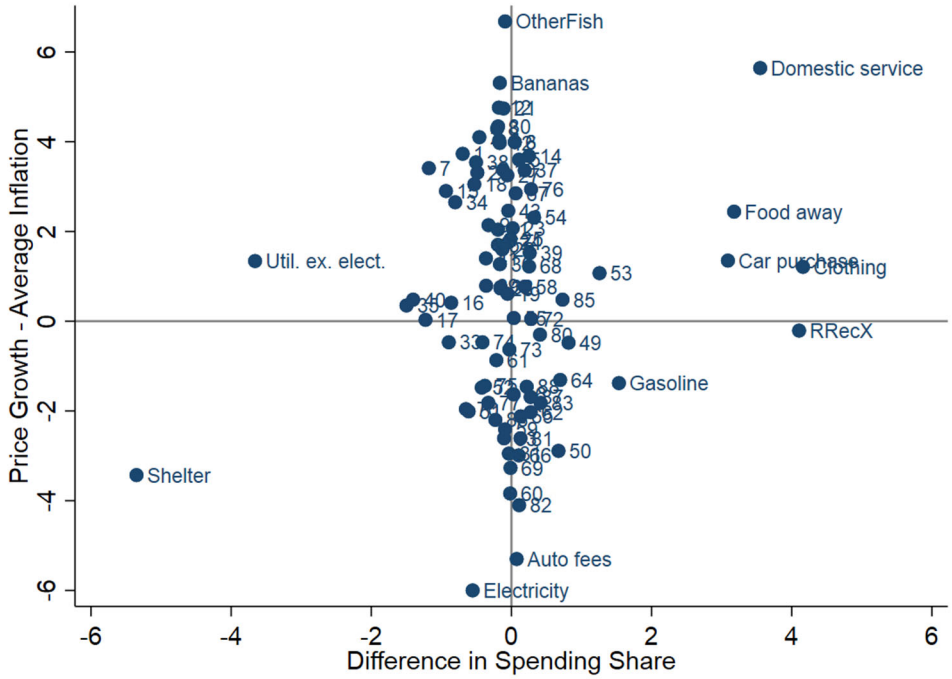
Note. Housing expenditures are rent for renters and the owner's expenditures for owners.

Figure 1
Spending Differences Across Education Groups and Relative Inflation by Item



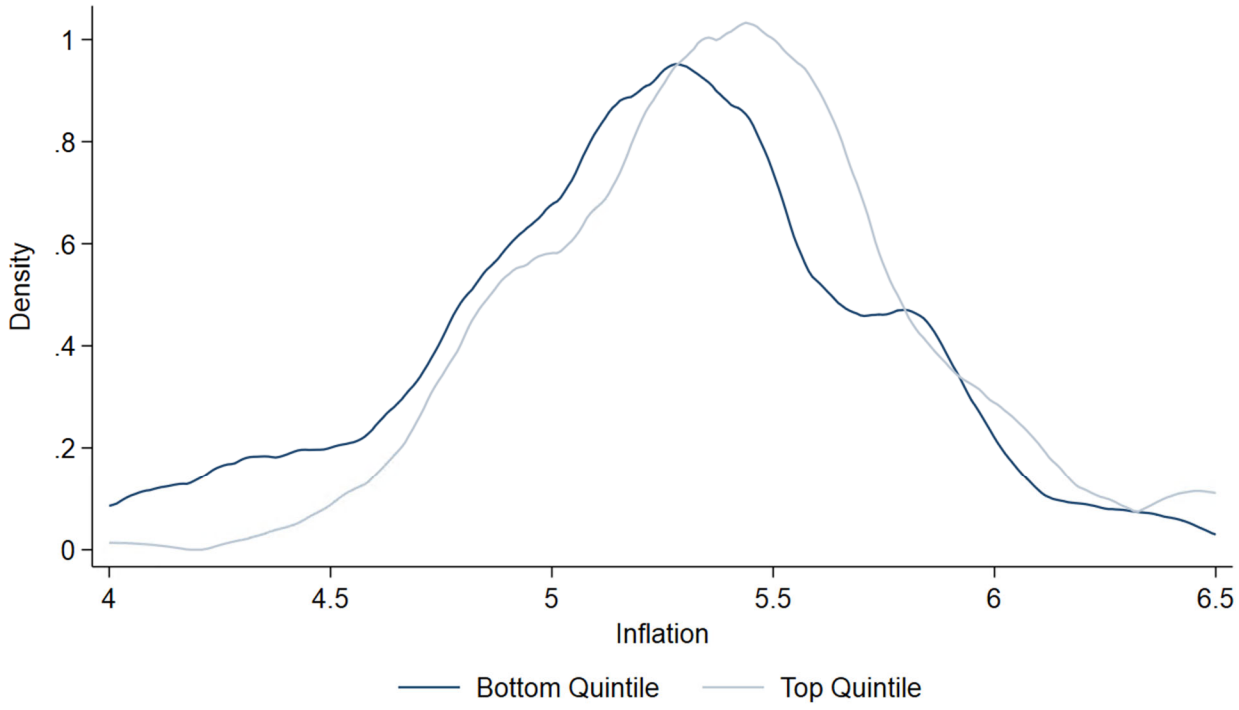
Note: The x-axis presents the difference in expenditure shares between families where the husband had 17 or more years of education relative to families where the husband had 8 or less years of education. The y-axis displays the difference between price growth for each item category and headline inflation. Expenditure shares are defined over 15 broad item categories.

Figure 2
Spending Differences Across Income Groups and Relative Inflation by Item



Note: The x-axis presents the difference in expenditure shares between families in the top quintile of the income distribution relative to families in the bottom income quintile. The y-axis displays the difference between price growth for each item category and headline inflation. Expenditure shares are defined over 89 item categories.

Figure 3
Distribution of Inflation Across Families
Panel A: By Family Income



Panel B: By Education of Head

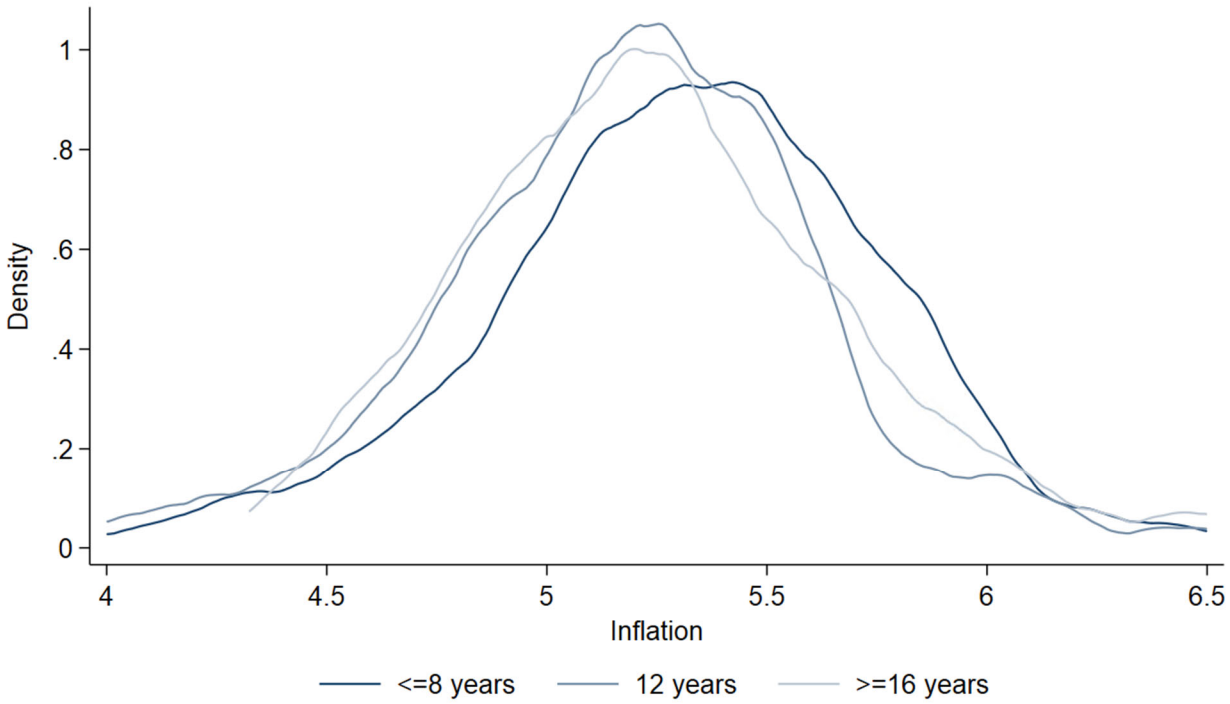
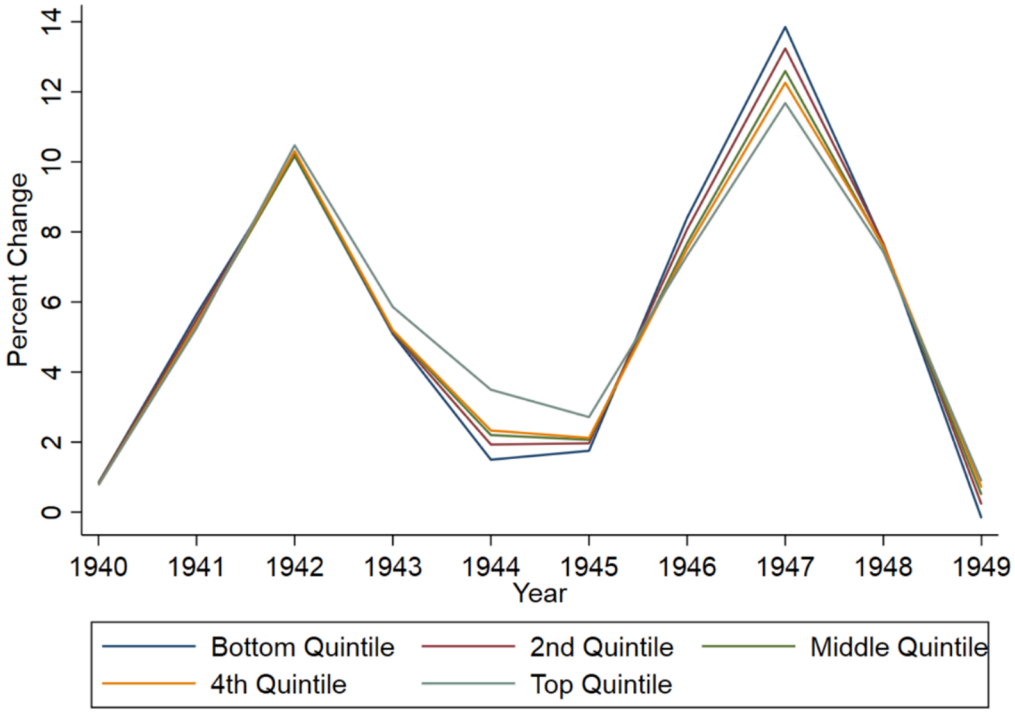
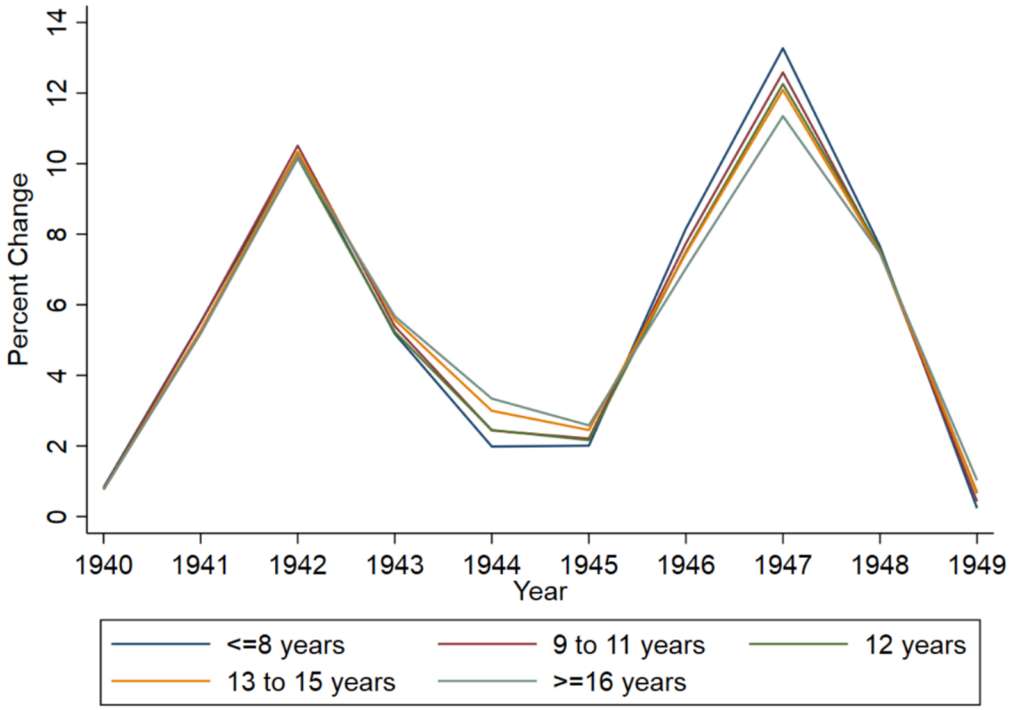


Figure 4
Annual Inflation 1940-1949
Panel A: By Family Income



Panel B: By Education of Head



Note: Estimates of annual inflation are calculated based on consumption baskets by family income (Panel A) and education of husband (Panel B) from the 1935-36 CEX and detailed price indexes for specific item categories from 1939 to 1949 published in various historical BLS reports.

Appendix Table 1
Housing Expenditure Shares in 1935-36 and 1950

	1935-36	1950
All Families	13.8	11.1
Renters	16.5	13.6
Owner-occupants	10.0	9.8
Counterfactual using 1950 homeownership rate	13.1	--
Homeownership rate	39.5	52.6

Note. The sample used to calculate the housing expenditure shares for renters and owners in 1950 includes single consumers in addition to families of at least two people. The homeownership rate of this sample is 48.7 percent and the aggregate housing expenditure share is 11.7 percent. The counterfactual housing expenditure share in 1935-36 is calculated as the average of housing expenditure shares for renters and owners, using the 1950 homeownership rate to weight each component.

Appendix Table 2
Comparison of ICPSR Sample of 1935-36 CEX with 1940 Census

	ICPSR Sample	1940 Census
Age		
Less than 30	13.9	14.6
30 to 39	33.0	28.0
40 to 49	27.4	27.1
50 to 59	16.3	19.6
60 or older	9.4	10.7
Education		
8 years or less	39.1	55.2
9 to 11 years	18.8	16.9
12 years	17.5	15.4
13 to 15 years	10.7	6.0
16 years or more	13.9	6.5
Occupation		
White collar	62.4	35.5
Blue collar	37.6	64.5
Professional and managerial	36.6	17.3
Clerical and sales	25.8	18.2
Craft	15.8	22.5
Operative	11.4	22.2
Laborer	3.3	11.0
Service	7.2	8.8
Housing tenure		
Homeowner	39.3	33.0
Renter	60.7	67.0
Race		
White	90.5	93.3
Black	9.5	6.7
Annual earnings of husband (1936 dollars)		
Mean	1678	1443
Median	1500	1296
City size		
Metropolis (pop>2 million)	14.3	25.4
Large (pop 100k to 2 million)	41.8	50.6
Midsize (pop 25k to 100k)	35.7	4.5
Small (pop 10k to 25k)	8.1	19.4
Region and city		
New York City	3.3	17.8
Northeast region ex. NYC	13.3	20.4
Chicago	11.0	7.6
Midwest region ex. Chicago	14.7	26.5
South	24.2	16.3
West	33.5	11.4

Note. 1940 Census includes white and black male heads of household, married with spouse present, in cities with a population greater than 10,000 and with family earnings of at least $300. We could not find city size definitions

used in the 1935-36 survey, so we guessed at the population cutoffs based on the city sizes in the sample and which category each city was assigned to. In the 1940 Census, only cities with population greater than 25 thousand are identified. Column (2) includes all of these cities plus families in urban areas with a population greater than 10 thousand.

Appendix Table 3
Distribution of Income in Full 1935-36 Survey of Consumer Purchases Compared with ICPSR's Sample of this Survey

Income level	Number of families in Urban Communities	Percent of families (calculated by authors)	Percent of families in the full ICPSR sample	Percent of families in the ICPSR sample used for analysis
Under $250	62	0.3	0.5	0.4
250-500	354	1.9	2.4	3.1
500-750	780	4.2	5.1	5.6
750-1000	1216	6.6	7.1	8.0
1000-1250	1607	8.7	9.6	10.0
1250-1500	1965	10.6	9.8	10.0
1500-1750	1882	10.2	10.5	11.2
1750-2000	2043	11.0	11.3	10.6
2000-2500	3528	19.1	18.4	18.0
2500-3000	1704	9.2	8.0	7.5
3000-4000	1756	9.5	9.1	8.2
4000-5000	824	4.5	3.5	3.3
5000-10000	670	3.6	3.9	3.4
10000-15000	77	0.4	0.6	0.6
15000-20000	15	0.1	0.1	0.1
20000+	13	0.1	0.2	0.0

Source for Column (1) is Table 1B, Section 3 of Appendix B in "Consumer Expenditures in the United States, Estimates for 1935-36" by the National Resources Committee.

Appendix Table 4
Linkage of Spending Categories to Price Indexes

Spending Category	Price Index Name	Price Index Source
Food	Food	BLS website: CUUR0000SAF1
Housing	Rent of primary residence	BLS website: CUUR0000SEHA
Electricity	Electricity	BLS website: CUUR0000SEHF01
Other utilities	Fuel oil and other fuels	BLS website: CUUR0000SEHE
Household operation	Household operation, total	BLS report "Price Indexes for Selected Items and Groups" Table 1
Furniture and furnishing	Housefurnishings	BLS report "Price Indexes for Selected Items and Groups" Table 1
Clothing	Apparel	BLS website: CUUR0000SAA
Automobile purchase	New vehicles	BLS website: CUUR0000SETA01
Gasoline	Motor fuel	BLS website: CUUR0000SETB
Other transportation	Transportation services	BLS website: CUUR0000SAS4
Personal care	Personal care	BLS website: CUUR0000SAG1
Medical care	Medical care	BLS website: CUUR0000SAM
Reading and recreation	Reading and recreation	Handbook of Labor Statistics 1967, Table 105
Tobacco	Tobacco and smoking products	BLS website: CUUR0000SEGA
Other	Other goods and services	Handbook of Labor Statistics 1967, Table 105

Note. The price index for "other goods and services" excludes food, housing, apparel & upkeep, transportation, medical care, personal care and reading & recreation. The price index for "housefurnishings" includes textiles, floor coverings, furniture, bedding, appliances and miscellaneous household items like dinnerware, paper napkins and electric lightbulbs.

Appendix Table 5
Linkage of Detailed Item Categories to Price Indexes and Sources

Item Category	Price Index	Source
Food		
Beef steak round	Steak, round	1967 HLS
Pot roast chuck	Chuck roast	1967 HLS
Beef rib roast	Rib roast	1967 HLS
Veal cutlets	Veal cutlets	1967 HLS
Other beef and veal	Beef and veal	1967 HLS
Pork chops	Pork chops	1967 HLS
Whole ham	Whole ham	1967 HLS
Bacon	Bacon	1967 HLS
Other pork	Pork	1967 HLS
Other meat	Meats	1967 HLS
Poultry	Poultry	1967 HLS
Fresh fish	Fish, fresh or frozen	1967 HLS
Canned salmon and other fish, cured fish, canned seafood, other seafood	Fish (includes fresh or frozen fish, canned fish and frozen seafood)	1967 HLS
Eggs	Eggs	1967 HLS
Sugar, molasses, corn syrup, jellies, jams, preserves, candy, other sweets, chocolate, cocoa, packaged desserts	Sugar and sweets	1967 HLS
Butter	Butter	1967 HLS
Vegetable shortening	Margarine	1967 HLS
Salad and cooking oil, mayonnaise, cod liver oil, lard	Fats and Oils	1967 HLS
Apples	Apples	1967 HLS
Bananas	Bananas	1967 HLS
Oranges	Oranges	1967 HLS
Carrots	Carrots	1967 HLS
Lettuce	Lettuce	1967 HLS
Cabbage	Cabbage	1967 HLS
Potatoes, white and sweet	Potatoes	1967 HLS
Onions	Onions	1967 HLS
Other fresh fruit and vegetables	Fresh fruit and vegetables	1967 HLS
Dried beans: navy, lima, peas, lentils	Dried beans	1967 HLS
Canned peas	Canned green peas	1967 HLS
Canned tomatoes	Canned tomatoes	1967 HLS
Other processed fruit and vegetables	Processed fruit and vegetables	1967 HLS
Flour: white, graham, rye	Flour	1967 HLS
White bread	White bread	1967 HLS
Corn flakes	Corn flakes	1967 HLS
Other grain products	Cereals and bakery products	1967 HLS
Milk: Whole (bottled and loose), buttermilk	Unweighted average of fresh grocery milk and fresh delivered milk	1967 HLS
Evaporated milk	Evaporated milk	1967 HLS
Cheese	Cheese	1967 HLS
Ice cream, cream, skimmed milk, dry milk, other milk	Dairy products	1967 HLS

Coffee	Coffee, can and bag	1967 HLS
Tea, fruit juice, soft drinks and other drinks	Nonalcoholic beverages	1967 HLS
Other food at home	Total food	BLS website
Food away from home	Total food	BLS website
Household operation		
Household help: cook, cleaner, laundress	Domestic services	PISIG
Laundry services	Laundry bundle services	PISIG
Telephone services	Residential telephone services	PISIG
Cleaning supplies	Cleanser and scouring powder	Bulletin 966
Other household operation	Household operation	PISIG
Furniture, furnishing and household equipment		
Household furnishing and equipment	Housefurnishings	PISIG
Furniture	Furniture	PISIG
Personal care		
Husband's personal care services	Men's haircuts	PISIG
Wife's personal care services	Beauty shop services	PISIG
Toothpaste	Toothpaste	PISIG
Shaving cream	Shaving cream	Bulletin 966
Toilet soap	Toilet soap	PISIG
Cold cream, powder, rouge, nail polish, perfume, brushes, combs, razors, files, other toilet articles	Toilet goods	PISIG
Other personal care	Personal care	PISIG
Medical care		
Physician office visits	General practitioners' fees, office visits	PISIG
Physician home visits	General practitioners' fees, house visits	PISIG
Dentist	Dentists' fees	PISIG
Medical specialists	Surgeons' and specialists' fees	PISIG
Optical: Oculist and glasses	Optical services	PISIG
Hospital room or bed	Hospital rates	PISIG
Private nurse in hospital	Hospital rates, private nurse	Bulletin 966
Medicines and drugs	Prescriptions and drugs	PISIG
Other medical expenses	Medical care, excluding drugs	PISIG
Recreation and reading		
Movies, adults	Motion picture admissions, adults	PISIG
Movies, children	Motion picture admissions, children	PISIG
Newspapers: daily and weekly	Newspapers	PISIG
Other recreation and reading	Reading and recreation	PISIG
Tobacco		
Cigarettes	Cigarettes	PISIG
Cigars	Cigars	PISIG
Other tobacco and smokers' supplies	Tobacco products	PISIG
Transportation		
Automobile purchase (new and used)	New automobiles	PISIG
Gasoline	Gasoline	PISIG
Motor oil	Motor oil	PISIG
Tires and tubes	Tires	PISIG
Auto repairs, replacement and service	Auto repairs	PISIG

Auto license and registration fees	Auto operations' licenses and fees	PISIG
Automobile insurance	Automobile insurance	PISIG
Other auto-related (garage rent, parking, fines and damages, tolls, auto accessories, other auto)	Total transportation	PISIG
Bus, trolley, taxi, train, ferry boat, rent of automobile, interurban bus	Streetcar and bus fares	PISIG
Railroad fare, including Pullman	Railroad fares, coach	PISIG

Note. 1967 HLS is the 1967 Handbook of Labor Statistics, Table 109. PISIG is the 1962 BLS report "Price Indexes for Selected Items and Groups," Table 1. Bulletin 966 is the BLS Bulletin 966, Appendix Tables F and G. All data were hand-collected by the authors. The price indexes reported in Bulletin 966 only cover 1939 to 1947, so we estimate the growth rate for 1939-49 using the growth rate of a broader category from 1939-49 and the ratio of the growth rate of the detailed category 1939-47 to the broader category 1939-47.

Appendix Table 6
Expenditure Shares by Income and Occupation in 1935-36

	Income Quintile					Occupation	
	1st	2nd	3rd	4th	5th	Blue Collar	White Collar
Food	35.5	32.3	29.4	28.0	23.9	31.6	26.8
Housing	20.7	18.9	17.7	16.8	14.6	17.0	16.7
Electricity	2.1	2.1	2.0	1.9	1.5	1.9	1.8
Other utilities	6.7	5.2	4.4	4.0	2.9	4.8	3.9
Household operation	3.5	4.1	4.6	4.8	7.1	4.1	5.8
Furniture, furnishing, equip.	2.4	3.4	3.5	3.2	3.9	3.1	3.6
Clothing	8.2	9.3	9.3	10.3	11.7	9.5	10.6
Automobile purchase	2.7	3.7	6.0	7.3	7.3	5.3	6.4
Gasoline	2.0	2.6	3.3	3.3	3.3	2.7	3.2
Other transportation	2.6	3.1	3.5	3.9	4.4	3.3	3.9
Personal care	2.3	2.2	2.1	2.1	2.0	2.2	2.1
Medical care	4.4	4.7	4.5	4.5	4.9	4.9	4.6
Reading & recreation	4.0	5.0	5.6	5.9	7.4	5.5	6.3
Tobacco	2.0	2.0	1.9	1.8	1.5	2.1	1.7
Other	1.1	1.4	2.1	2.2	3.6	2.0	2.6

Note. Housing expenditures are rent for renters and the owner's estimate of rent for owners. Other expenditures include education and occupation-related expenses. Income quintiles are defined over the distribution of households in the ICPSR 1935-36 data.

Appendix Table 7
Distribution of Families by Region and Income and Implications for Inflation

	Income Quintile					Rent Growth 1940-49
	1st	2nd	3rd	4th	5th	
New York City	18.0	16.2	17.1	18.0	20.0	1.03
Northeast Region ex. NYC	20.2	21.6	22.4	20.0	17.9	2.04
Chicago	6.5	7.0	8.0	7.9	8.7	2.98
Midwest Region ex. Chicago	23.3	25.4	29.3	28.8	25.3	2.36
South	22.0	20.3	12.0	12.8	14.6	2.65
West	10.1	9.6	11.2	12.5	13.6	2.75
Shelter component of inflation						
Using aggregate rent growth	0.57	0.47	0.44	0.41	0.35	--
Using regional rent growth	0.56	0.45	0.43	0.40	0.35	--

Appendix Table 8
Aggregate Expenditure Shares During the 1940s

	1935-36	1941	1944	1945	1946	1947	1948	1950
Food	29.3	30.9	35.9	34.8	34.5	32.7	30.4	31.1
Housing, fuel, light & refr.	20.2	18.7	17.5	15.7	15.5	16.5	14.9	15.1
Household operation	5.5	5.3	5.3	6.0	4.5	5.5	5.0	4.7
Furnishing and equipment	3.6	5.0	3.3	4.5	5.2	5.9	7.1	7.1
Clothing	10.6	12.0	16.0	15.6	16.2	14.7	13.6	11.5
Automobile	12.0	9.6	3.9	4.7	6.3	7.0	10.2	12.1
Other Transportation	1.3	2.4	2.4	2.2	1.9	2.1	1.8	1.7
Medical care	4.8	4.7	5.5	6.1	4.7	5.0	5.7	5.2
Personal care	2.2	2.2	2.4	2.5	2.4	2.4	2.3	2.2
Recreation	5.2	4.4	2.8	2.9	3.9	4.1	4.5	4.5
Reading	1.0	1.0	1.1	1.1	0.9	0.9	0.9	0.9
Education	1.1	0.9	0.6	0.7	0.6	0.5	0.6	0.6
Tobacco	1.8	2.1	2.0	1.7	1.9	1.7	1.7	1.8
Other	1.4	0.8	1.3	1.6	1.5	1.0	1.4	1.5

Note. Spending shares in 1941 and 1944 are from "Consumer spending in World War II: the forgotten consumer expenditure surveys," *Monthly Labor Review* August 2015. Spending shares in 1945 to 1948 are author calculations from the Handbook of Labor Statistics 1950 Table D7. The 1945-48 surveys covered three cities in each year. We take an unweighted average of spending in each city.