RESEARCH IN ECONOMIC HISTORY

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INTRODUCTION

Research in Economic History is a refereed journal, specializing in economic history, in the form of a book. We publish articles that follow the standard formats of economics journals, but we can also accommodate longer pieces, historical narratives, and articles that primarily present newly-constructed data sets.

In this volume, Kim Abildgren estimates the effect of changes in relative prices on the distribution of real household income in Denmark during the Great Depression, 1930 to 1935.

Ranjit S. Dighe argues for the importance of expository editorials in the then new magazine, *Business Week*, in spreading awareness of and gaining acceptance for Keynesian policies among US business elites.

Howard Bodenhorn, Timothy W. Guinnane, and Thomas A. Mroz note that while many existing studies use data on heights to study historical living standards, most historical height data come from special sub-populations such as volunteer soldiers, who may not have been typical of the general population because of selection bias. Apparent differences in heights across time and across place may reflect selection rather than changes in population heights. The authors construct a theoretical model to show how the decision to join the military under changing economic conditions may lead to biased height measurements. They then develop a simple, robust diagnostic for the existence of such selection in a data set.

Barry Eichengreen, Michael Haines, Matthew Jaremski, and David Leblang examine the relationship between county-level votes for Bryan versus McKinley in the election of 1896 and county-level data of economic and demographic factors. Based on the estimated relationships they speculate as to the economic conditions that would have been needed to cause Bryan's election.

Arnaud Manas uses newly created data on the shareholders of the Banque de France from its creation through 1945 to debunk a myth that the Banque was controlled by its large shareholders, and to generally understand the relationship between the Banque's policies and the interests of its shareholders. He finds that Banque shares were a lackluster but popular investment, at first held mainly by the rich and powerful, but later held by "petit-bourgeois" passive rentiers who were disengaged from the Banque's management, allowing it to be controlled by the government long before it was nationalized.

Lars Nyström uses data from Sweden to test Deirdre McCloskey's theory that the open fields existed mainly to reduce the risk faced by a farmer due to the caprices of nature. Nystrom finds that in Sweden, at least, scattering did protect against very local crop failures, but not against the large-scale regional harvest disasters that constituted a much more serious threat to peasants of the time.

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HOUSEHOLD-LEVEL DEFLATION INEQUALITY IN DENMARK DURING THE GREAT DEPRESSION

Kim Abildgren

ABSTRACT

Empirical studies on household-level inflation inequality have so far only focused on periods with positive inflation rates. However, the major concern on the policy agenda since the most recent financial crisis has been deflation rather than inflation. This naturally raises the question regarding the effect of deflation on the distribution of real income when households spend their budget on different consumption bundles. This chapter compiles annual household-level inflation rates in Denmark from 1930 to 1935 based on microdata from the Expenditure and Saving Survey of 1931 and price data from the official Retail Price Index. The results indicate that lower-income households faced a larger decline in prices on their consumption of goods and services during the deflation years 1930–1932 than higher-income households did. The deflation thus contributed to narrowing the difference in real incomes between the top and bottom parts of the income distribution during the recession. In the years 1933–1935 with positive inflation rates, the lower-income households experienced higher inflation rates than higher-income households. Over the period 1930–1935 seen as a whole, the price development contributed slightly to reducing real income inequality. The low degree of medium-term persistence of differences in household-specific inflation rates is consistent with previous findings in various time periods from the 1960s to the 2000s without any persistent deflation events. The chapter at hand is the first empirical study of the direct distributional effects of price developments at the household level in a period with persistent deflation.

Keywords: Deflation; Great Depression; household microdata; inflation inequality; business cycles; economic history

JEL classifications: C43; C81; D12; E31; I31; N14

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INTRODUCTION

Inflation is usually defined as general increases in the price level, and it is typically measured by a nation-wide aggregated "headline" price index – such as the Consumer Price Index (CPI) – compiled by a national statistical agency. However, few households have a consumption pattern that corresponds exactly to the basket of goods and services used for the compilation of the aggregated CPI, and the development in the prices of individual commodities do not usually follow the development of the aggregated headline price index. This has created an interest in research on so-called household-specific or household-level inflation rates in order to assess the direct distributional effects of inflation. A number of empirical studies have made use of household-level microdata to document substantial heterogeneity in the actual price development experienced by different households with different consumption bundles (Cepparulo, Gastaldi, Liberati, & Pisano, 2012; Chang, Chang, & Lieu, 2004; Hagemann, 1982; Hait & Janský, 2016; Hobijn & Lagakos, 2005; Michael, 1979), Several of these studies have found that the direct distributional effects from inflation inequality can be significant in the shorter run but tend to be limited in the medium term or longer run.

The empirical literature on household-level inflation has so far only focused on selected time periods of varying length since the mid-1960s characterized by positive inflation rates measured by the aggregated CPI. However, the major concern on the policy agenda since the most recent financial crisis has been deflation rather than inflation. This naturally raises the question regarding the effect of deflation on the distribution of real income when households spend their budget on different consumption bundles.

Many countries experienced persistent deflation during the Great Depression in the 1930s (Bordo & Filardo, 2005). The early 1930s were characterized by financial crises and recession in the economy, and during the most recent financial crisis in 2008–2009, the Great Depression was still used as a widespread and relevant reference period for current events (Eichengreen, 2012). The deflation in the 1930s, as well as other historical deflation episodes, has so far only been studied at a macroeconomic level. In the chapter at hand, we fill a gap in the literature by conducting an empirical study of the direct distributional effects of price developments at the household level in a period with deflation.

We compile annual household-level inflation rates for nonhousing goods and services in Denmark from 1930 to 1935 based on microdata from the Expenditure and Saving Survey of 1931 and price data from the official Retail Price Index (RPI). Based on this new data set, we analyze the direct distributional impact of inflation at the household level in the first half of the 1930s. The years 1930–1932 were characterized by persistent deflation measured by the aggregated RPI, whereas the subsequent years 1933–1935 saw positive aggregated rates of inflation. Furthermore, we consider the effect of including housing in the consumption bundle.

We find that there were substantial and statistically significant differences in inflation rates across households in different income groups in the first half of

the 1930s. Lower-income households faced a larger decline in prices on their consumption of nonhousing goods and services during the deflation years 1930–1932 than higher-income households did. The deflation thus contributed to narrowing the difference in real incomes between the top and bottom parts of the income distribution during the recession. In the subsequent years 1933–1935 with positive rates of inflation, the lower-income households experienced higher inflation rates than higher-income households. Over the period 1930–1935 seen as a whole, the price development contributed slightly to reducing real income inequality. The findings regarding the relationship between income and household-level inflation rates are robust to the inclusion of housing in the consumption bundle.

The low degree of medium-term persistence of differences in household-specific inflation rates in Denmark in the first half of the 1930s seems to be consistent with previous findings for other countries in various time periods from the 1960s to the 2000s without any persistent deflation events.

THE DANISH EXPENDITURE AND SAVING SURVEY OF 1931

The information on household-level expenditures by commodity groups as well as on the households' demographic, social, and economic characteristics was obtained from the Danish Expenditure and Saving Survey of 1931 (cf. Det Statistiske Departement, 1936). The survey concerned the income and consumption expenditures of households of wage and salary earners, and it was carried out by the households' completion of detailed diary accounts for each day of the entire year.

We had access to the detailed micro-level data (without personal identification) on paper for all the 519 households in the final sample of the Expenditure and Saving Survey, and we digitized and coded a large range of variables from this material (cf. Table 1). We excluded six records with missing information, which left us with a sample of 513 households.

It should be noted that the Expenditure and Saving Survey did not cover pensioners and self-employed persons. Furthermore, the final sample did not represent a random selection of wage and salary earners in Denmark in 1931. Compared to the total population, the survey had an overrepresentation of wage earners with relatively high levels of income. This reflects that the survey was carried out in a time when formalized sampling techniques were not yet introduced at Statistics Denmark (Danmarks Statistik, 1989). However, the sample still allows us to compile household-specific inflation rates that can give a rough idea of the extent of inflation heterogeneity among different types of Danish households in the early 1930s.

COMPILATION METHODS

First, a few remarks should be given regarding the treatment of housing in consumer price indices. The issue is rather straightforward for tenants that pay rents

Table 1. Variables Derived from the Danish Expenditure and Saving Survey 1931.

Variable	Description	Units
HOMEOWNER	Equals one if homeowner and else zero	Dummy variable
TENANT	Equals one if tenant and else zero	Dummy variable
CAPITAL	Equals one if resident in the capital and else zero	Dummy variable
PROVIN	Equals one if resident in a provincial town and else zero	Dummy variable
RURAL	Equals one if resident in a rural district and else zero	Dummy variable
WAGEEARN	Equals one if household head is wage earner and else zero	Dummy variable
SALARIED	Equals one if household head is salaried employee and else zero	Dummy variable
AGE	Age of household head. Household head is defined as the person within the household with highest income. The compilation of "highest income" is done under the assumption that any sick allowance and/or unemployment relief is part of the husband's income	Number of years
INCOME	Income after personal taxes (disposable income). Income covers cash wages and salaries, estimated net value of consumption of home-grown and home-made products, payment by lodgers, unemployment relief, sick allowance, etc. and net interest etc. (excluding interest expenditures related to housing loans). Personal taxes do not include taxes on land and buildings	Danish kroner per household
SIZECU	Size of household measured in consumption units. Full-time basis. Includes husband, wife, children living at home, and others who stayed permanently with the household. Compiled by Statistics Denmark. Each household member is assigned a weight according to the following scale: 1 child below the age of 4 years = 0.15; 1 child of age 4−6 years = 0.40; 1 child of age 7−10 years = 0.75; 1 child of age 11−14 years = 0.90; 1 woman over 14 years = 0.90; 1 man over 14 years = 1.00	Number of consumption units
FOOD	Consumption of food and nonalcoholic beverages	Danish kroner per household
CLOTHWASH	Consumption of clothing, footwear, and washing	Danish kroner per household
FUEL	Consumption of fuel and lighting	Danish kroner per household
OTNHCONS	Consumption of other goods and services except housing	Danish kroner per household
DWELLING	Expenditures on housing. Tenants: Ordinary rent. Homeowners: Expenditure on maintenance, insurance, interest and installments on mortgage debt, and taxes on land and buildings	Danish kroner per household
HTC0C	Equals one if couple without children and else zero	Dummy variable
HTC1C	Equals one if couple with one child and else zero	Dummy variable
HTC2C	Equals one if couple with two children and else zero	Dummy variable
HTC3C	Equals one if couple with three children and else zero	Dummy variable
HTC4OMC	Equals one if couple with four or more children and else zero	Dummy variable
HTOTHER	Equals one for other types of household and else zero	Dummy variable

Source: Det Statistiske Departement (1936).

but is more complicated for homeowners. According to international statistical guidelines (ILO, IMF, OECD, Eurostat, United Nations, & World Bank, 2004), the purchase of houses and apartments should in principle be seen as an investment in fixed assets that are used by their owners to produce housing services. Housing consumption for homeowners should therefore ideally be the implicit rental value of houses and apartments owned. This cannot be observed and has to be estimated if owner-occupied housing is to be included in the CPI. There are different approaches to deal with this issue in modern days' CPIs. Eurostat's Harmonised Consumer Price Index (HICP) for countries in the European Union simply excludes owner-occupied housing whereas, for instance, Statistics Denmark's official CPI includes owner-occupied housing based on a rental equivalence approach. In the latter, the housing consumption of homeowners is an imputed rental value of houses and apartments owned, and the related price index is the development in rents for corresponding rental dwellings.

In the Expenditure and Saving Survey of 1931, the housing expenditures for homeowners were not imputed rents but expenditures on taxes on land and buildings, housing maintenance, and insurance, as well as interest and installments on mortgage debt. In order to obtain consumption and inflation data that are comparable between homeowners and tenants, we chose therefore to focus our main analysis on the households' consumption of goods and services excluding housing. However, we will explore the robustness of the findings in the main analysis to the inclusion of rental prices in the household-specific inflation rates in a later section on 'Housing Consumption'.

For the main analysis, we divided each household's nonhousing consumption expenditures into four main groups:

(1) food and nonalcoholic beverages;
(2) clothing, footwear, and washing;
(3) fuel and lighting; and
(4) other goods and services except housing.

Nation-wide inflation figures for the four main consumption groups over the period 1930−1935 were obtained from the official RPI published by Statistics Denmark (cf. the price indices in Fig. 1).

For an individual household, the loss in real income as a result of unfavorable movements in relative prices is no different from the loss in real income due to an increase in the general price level. In the literature, all price increases at the household level are therefore usually included in household-level inflation measures. For each household i, we compiled the household-specific inflation rate in a given year t ($HSI_{i,t}$) as a weighted arithmetic average of the annual percentage price changes (PI_j) of the four main consumption groups ($j = 1, \ldots, 4$) mentioned above according to the official RPI statistics (cf. Eq. (1)). The weights ($w_{i,j}$) applied for each household i were the shares of the nonhousing consumption budget that the household used on the four consumption groups in 1931 according to the Expenditure and Saving Survey. Our household-specific inflation rates were thus compiled using a fixed-weight ("Laspeyres-style") price index.

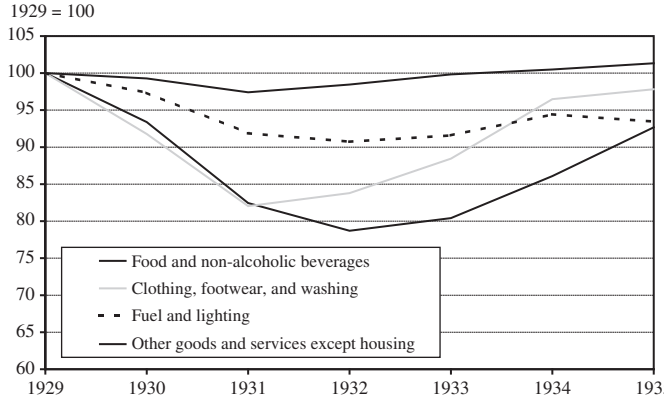

Fig. 1. Price Indices for Main Consumption Groups, 1929–1935. *Source*: Official RPI statistics from Statistics Denmark.

$$HSI_{i,t} = \sum_{j=1}^{4} w_{i,j} PI_j, \; i = 1, ..., 513 \tag{1}$$

As can be seen from Table 2, the unweighted averages of the household-specific inflation rates (excluding housing) are fairly close to the inflation rates measured by the aggregated official RPI excluding housing.

DESCRIPTIVE ANALYSIS

The studies on household-level inflation since the mid-1960s referred to in the first section have in general found a substantial variation in inflation rates across households in a given year. There were also large differences in the inflation experiences of Danish households in the early 1930s (cf. the estimated densities of the cross-household distribution of inflation rates in each of the years 1930–1935 in Fig. 2). The degree of heterogeneity in the household-level inflation rates was at least as large in years with deflation as in years with inflation.

All the unconditional distributions in Fig. 2 appear to be fairly symmetric around the mean, but the household-level inflation rates seem to have been more widely dispersed in years with high rates of inflation or deflation than in years with low rates of inflation or deflation. It is a common finding in the previous literature that inflation rates are more widely dispersed across households when inflation levels are high. Our results indicate that the same holds for high levels of deflation. The inflation rates in the 1930s measured by the aggregated RPI (excluding housing) were thus not representative for a large share of the households when there were large upward or downward movements in the aggregated index.

Fig. 3 shows a plot of the average inflation rate in the years 1930–1932 at a household level against the average inflation rate in the years 1933–1935 for the

Table 2. Inflation Rates (Excluding Housing).

Price Index	Inflation Rate								
	1930	1931	1932	1933	1934	1935	Annual Averages		
							1930–1932	1933–1935	1930–1935
	% p.a.								
Aggregated RPI									
Food and nonalcoholic beverages	−6.6	−11.7	−4.5	2.2	7.1	7.7	−7.6	5.6	−1.0
Clothing, footwear, and washing	−8.2	−10.6	2.1	5.6	9.1	1.4	−5.6	5.3	−0.1
Fuel and lighting	−2.6	−5.6	−1.3	0.9	3.1	−1.1	−3.2	1.0	−1.1
Other goods and services except housing	−0.7	−1.9	1.1	1.4	0.7	0.8	−0.5	1.0	0.2
Total RPI, excluding housing	−4.7	−7.9	−1.3	2.4	5.1	3.8	−4.6	3.7	−0.5
Memo									
Unweighted average of household-specific inflation rates, excluding housing	−4.4	−7.4	−1.2	2.3	4.7	3.6	−4.3	3.5	−0.4

Source: Author's calculations, see the main text.

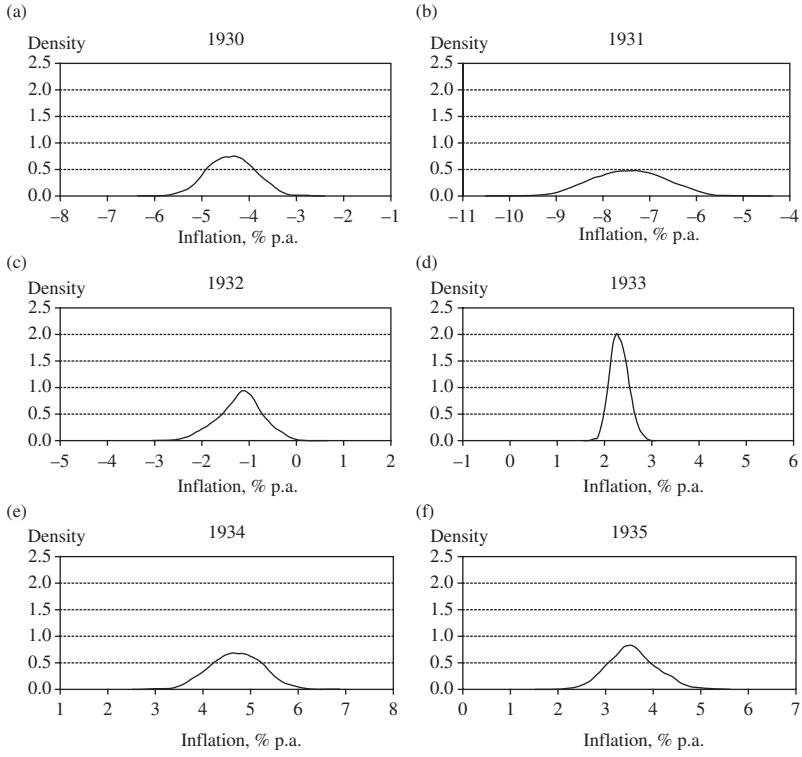

Fig. 2. Distribution of Inflation across Households for Each of the Years 1930–1935. *Source*: Author's calculations based on the data described in the main text. *Note*: Density plots estimated via Gretl using Epanechnikov kernels. Household-level inflation excluding housing.

same households. Individual households that faced a relatively large decline in prices during the deflation years 1930–1932 tended to experience a relatively large increase in prices during the inflation years 1933–1935. The correlation coefficient is −0.98. The medium-term persistence of differences in household-specific inflation rates seems thus to have been rather low. The distributional effects from inflation inequality in the 1930s were much stronger in the short term than in the medium term. This corresponds to findings on household-level inflation for US households in various time periods from the late 1960s to the early 2000s (cf. Michael, 1979 and Hobijn and Lagakos, 2005).

It is interesting to explore in more detail whether some types of households persistently experienced higher or lower inflation rates than others. Poor households might, for instance, have a different consumption pattern with different price development than richer households. Table 3 indicates that there were substantial differences in inflation rates across households in different income