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Consumption Inequality During and After the COVID-19 Pandemic

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Introduction

In this paper we study consumption inequality before, during, and after the COVID-19 pandemic. We use quarterly data from the U.S. Consumer Expenditure Survey for this study augmented with additional data and imputations to produce our consumption measure. We find that consumption inequality declined from 2019 to 2020 before recovering in 2021 and 2022. By 2022, consumption inequality was similar to 2019 levels. This trend is consistent with other measures of inequality during this period such as after-tax income inequality. To better understand the drivers of the changes in consumption inequality, we decompose the Gini coefficient by category of consumption and decompose the Theil index by household demographic characteristics.

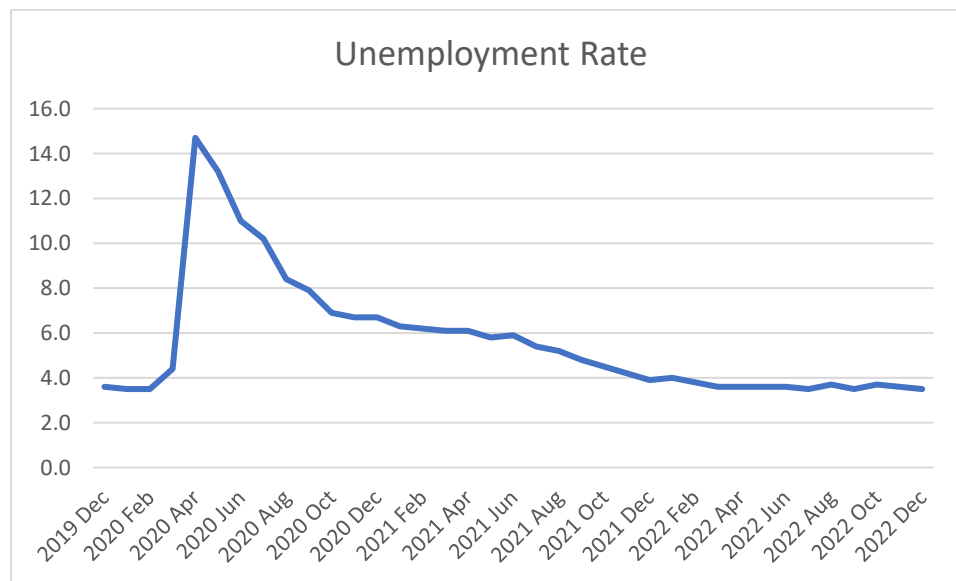
The decline in overall inequality in 2020 was due to shifts away from the consumption of certain goods and services, not due to reductions of within consumption category inequality. The categories that were most impacted by the pandemic were those that contributed the most to inequality relative to their share of consumption. These include shelter other than the primary residence, entertainment (ticket and fees), and food away from home. As the consumption of goods and services in these categories recovered after the pandemic, overall consumption inequality increased. For the demographic decomposition, we find that most inequality is explained by within group inequality rather than between groups for the demographic characteristics we consider. The between groups contribution to inequality for family type (i.e., married, single, with or without children) falls over this period, which could reflect the impact of government assistance which targeted families with children.

Background

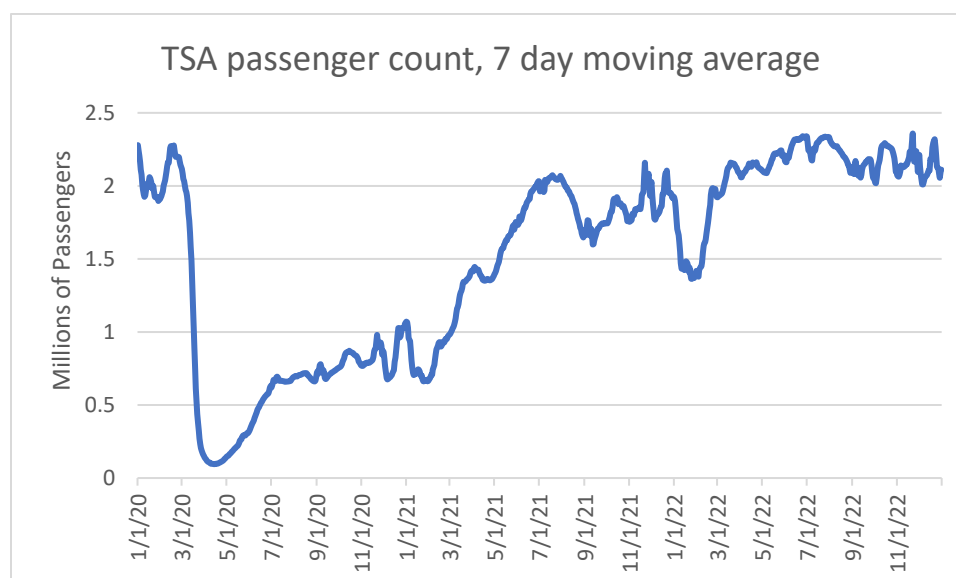
COVID-19 Pandemic: Economic Impact and policy response

The COVID-19 pandemic greatly disrupted the economy. Although, the initial effects of the pandemic on the economy began in early 2020, the major disruptions occurred after the declaration of a federal emergency on March 13, 2020. At this point, states began to restrict in-person activities and close non-essential businesses. Schools moved online, and many people who weren't laid off were able to continue to work from home. The following figure shows the unemployment rate. The unemployment rate went from 3.6 percent in December 2019 to 14.7 percent in April of 2020, before declining and returning to pre-pandemic levels in early 2022.

Many macroeconomic variables follow a similar pattern. A sharp disruption at the start of COVID, followed by a gradual return to normal. For a detailed study of the economic impact of the onset of the pandemic see Chetty, et al (2023).



The pandemic led to large shifts in the pattern of household expenditures. Looking at the changes in expenditures in the CE from 2019 to 2020, some categories like food away from home, recreation services, and transportation had large declines. Other categories like food at home and many categories of goods had large increases (BLS 2022). Spending patterns began to normalize in 2021 as the vaccine became widely available and pandemic restrictions were lifted (BLS 2023). Another way to see the impact of COVID-19 on transportation related spending is to look at flight data, though it also reflects the pandemic impact on business travel. The following figure shows the daily TSA passenger counts. Air travel dropped precipitously at the start of the pandemic before gradually recovering over the next few years.



The disruption from the pandemic was unprecedented in recent history, but so was the policy response and speed of the labor market recovery. Some of the major sources of government support for households was the expansion of unemployment benefits (expanding eligibility and increasing the benefit amount), multiple rounds of direct transfers to households (i.e., Economic Impact Payments), and an expansion of the Child Tax Credit. The direct transfers and Child Tax Credit expansion was phased out for higher levels of income. There was also an expansion of other government programs. For example, Medicaid eligibility was loosened through the continuous enrollment provision (Williams, et al 2023), and the National School Lunch Program was expanded (Shrider 2021). In-kind benefits are included in our measure of consumption. In the measure of consumption used for this study, cash transfers and tax rebates are not included directly, but they are used to finance consumption expenditures. Another feature of the recovery was the large increase in inflation. Inflation affects the nominal spending patterns over this period, which can have differential impacts on households; however, the inequality analysis does not require nominal values to be deflated as households are compared at the same point in time.

When looking at consumption over this period, there are 2 important dynamics to consider. First is the sudden onset and gradual recovery from the pandemic itself, which affected the components of consumption differently. This will have different effects for different households because the components of consumption most affected by the pandemic will be larger shares of overall consumption for some households. Similarly, the government assistance will impact some households more than others as will the loss and recovery in labor income. To better understand these impacts on overall consumption inequality, we will decompose the contribution to overall inequality by components of consumption and by household demographics.

Inequality and Poverty During COVID-19

Official data sources and academic research show the profound impact of COVID on inequality and poverty across a range of resource measures. The impact of the COVID-19 pandemic on the labor market and the economy as well as the government response was unprecedented in its scale. Generally, the pandemic recession and recovery led to a decrease in inequality across many measures of resources, particularly for those measures that include the full impact of government assistance.

The Census Bureau produces official income and poverty measures using the CPS-ASEC. In terms of inequality, pre-tax money income inequality increased slightly in 2020 compared to 2019 and remained at a similar level in 2021 and 2022 (Guzman and Kollar 2023). The increase in pre-tax money income inequality occurred despite there being compression in the distribution of wages over this period (Autor, et al 2023). Similarly, the official poverty rate increased slightly in 2020 and remained at a similar level in 2021 and 2022 (Shrider and Creamer 2023). The official

poverty rate uses pre-tax money income as the resource measure. The primary limitation for using pre-tax money income as a measure of household wellbeing during this period is it fails to capture much of the government assistance, which took the form of tax-credits or in-kind benefits. The Supplemental Poverty Measure (SPM) resource measure is also based on the CPS-ASEC but includes tax credits and in-kind benefits. The SPM poverty rate fell sharply in 2020 and continued to decline in 2021 due to the government assistance in response to COVID. The SPM poverty rate increased sharply in 2022 back to the pre-pandemic level reflecting the expiration of the government programs. A limitation of the CPS-ASEC income measures is that there was a large underreporting of unemployment benefits during this period. Larrimore, et al (2022) document the large underreporting, and show that correcting for the underreporting would have led the official poverty rate to fall in 2020.

The Bureau of Economic Analysis (BEA) produces distributional Personal Income (PI) data which uses the national accounts income concepts. Personal income and disposable personal income become more equally distributed in 2020, with disposable personal income continuing to become more equally distributed in 2021 (BEA 2023). However, both personal income and disposable personal income become less equally distributed in 2022 and return to a similar level to 2019. The 2022 data are preliminary and are the most current available data. Other academic research shows similar patterns in pre-tax and after-tax income inequality. The real time inequality measure of Blanchet, et al (2022) shows pre-tax income inequality decreasing in 2020 before increasing to levels above pre-pandemic. After-tax income inequality shows a similar pattern but is still below pre-pandemic levels as of 2022. Heathcote, et al (2023) also find a reduction in disposable income inequality during the pandemic.

Wealth can also be used as a measure of resources to measure household well-being. The Survey of Consumer Finances (SCF) produced by the Federal Reserve Board provides detailed information on household wealth. The survey is only conducted every 3 years, so it cannot measure wealth dynamics throughout this period, but the current results for 2022 can be compared to pre-pandemic (2019) values. Overall, real household net worth increased sharply across the distribution (Aladangady, et al 2023). However, the gains at the bottom of the distribution were larger than at the top of the distribution, so wealth inequality fell. This is similar to the results of Blanchet, et al (2022) who find that wealth inequality fell except at the very top of the distribution. The SCF's measure of pre-tax income shows that inequality increased from 2019 to 2022.

An advantage of using expenditures or consumption as a measure of wellbeing during this period is that underreported cash benefits such as unemployment do not impact measures of expenditures or consumption. Another benefit of expenditures or consumption is that there were large shifts in savings behavior during the pandemic. Heathcote, et al (2023) find a reduction in consumption expenditure inequality in 2020 and 2021 using Consumer Expenditure Survey (CE) data. BLS (2023) uses CE data to create distributional PCE data, which captures the distribution of consumer expenditures using the concepts and totals from the national

accounts. They find that PCE becomes more equally distributed from 2019 to 2020 but returns to pre-pandemic levels of inequality in 2021. Han, et al (2023) update the consumption measure of Meyer and Sullivan (2012) through 2022 and produce a consumption poverty measure using an absolute threshold updated for inflation. They find that consumption poverty, which was already declining pre-COVID, continued to decline through 2022. Using the same consumption measure from this paper, we find that relative consumption poverty fell in 2020 before increasing to pre-pandemic levels by 2022 (Garner, Matsumoto, and Schild 2023). However, using an absolute threshold anchored to the 2019 relative threshold but updated for inflation, we find that poverty fell slightly in 2020 but continued to decline in 2021 and 2022.¹

Methods

Construction of the BLS consumption measure

In this section we provide a brief overview of our consumption measure. For full details regarding the construction of the measure see Garner, et al (2023). For many goods and services, consumption will equal expenditure for a given period, so our measure starts with expenditures from the U.S. Consumer Expenditure Survey (CE) Interview Survey. The CE consists of two separate surveys, an interview and a diary survey, which are administered to separate samples. The diary survey is designed to capture expenditures for commonly purchased items, though expenditures in these categories for commonly purchased items are often included in the interview survey as well. The interview survey captures approximately 95 percent of total expenditures and is the basis of our measure. The unit of analysis is at the consumer unit (CU) level.² CUs represent expenditure sharing units and are similar to households.

For some categories, expenditures are not a good proxy for consumption. For durable goods, the goods are consumed over multiple periods while the expenditures occur all at once. Also, so categories of spending are better thought of as savings (e.g., pension contributions) or investments in human capital (e.g., education or medical care) rather than consumption. Importantly for the study of the COVID period, we consider child care expenses to be investments rather than consumption. For the durable goods of housing and vehicles, we use a flow of services approach to value the consumption value. For housing, the CE asks owners about the rental equivalence, which we use instead of out-of-pocket expenditures. We exclude expenditures for the purchase of major appliances as we assume the flow of services of these are implicit in rental equivalence and reported rents; this assumption is based on the fact that in

¹ The results are similar when anchoring to a 2019 threshold that matches the official poverty rate.

² A consumer unit is defined as either (1) all members of a particular household who are related by blood, marriage, adoption, or other legal arrangements; (2) a person living alone or sharing a household with others or living as a roomer in a private home or lodging house or in permanent living quarters in a hotel or motel, but who is financially independent; or (3) two or more persons living together who pool their income to make joint expenditure decisions. Financial independence is determined by the three major expense categories: housing, food, and other living expenses. To be considered financially independent, a respondent must provide at least two of the three major expense categories. <https://www.bls.gov/opub/hom/glossary.htm#C>

the U.S., most rental units come furnished with major appliances. For vehicles, we construct a measure of user cost based on estimates of depreciation and opportunity costs. Finally, we exclude categories of spending that do not reflect current consumption and purchases for individuals outside of the CU. Health insurance is an important category that has features of both consumption and investment, and the inclusion of health insurance in a consumption measure is controversial. Therefore, we produce versions with and without health insurance.

Another limitation of the CE data for constructing a measure of consumption is that it only includes expenditures for goods and services. Therefore, it does not include the value of in-kind benefits. One barrier to imputing the value of in-kind benefits is that the CE does not ask about participation (with the exception of SNAP with the value of these implicitly counted in food expenditures). For NSLP, WIC, and LIHEAP, participation is imputed using CPS-ASEC data. Regression models of participation are estimated on the CPS-ASEC data, and the estimated coefficients of these models are used to predict participation in the CE. LIHEAP values are also imputed from CPS ASEC data; however, data from the USDA are used to assign NSLP and WIC values to CUs imputed as participants. Another in-kind benefit not captured by out-of-pocket spending is rental assistance. This is defined as the difference in the market value of rent and what is paid by the CU. For those paying below market rents, their out-of-pocket spending does not reflect the full consumption value of housing. We use regression models for those paying full market rent to impute the value of the consumption for those paying below market rent. Finally, the out-of-pocket expenditures do not capture the full value of health insurance. The CE does ask about health insurance coverage, so we impute the full value of health insurance to capture the value of government assistance or the employer contribution to employer provided health insurance. For our main results we use a measure of consumption that caps health insurance to be no more than 50 percent of total consumption.

Once we calculate consumption values at the CU level, we calculate equivalized consumption. To adjust consumption for CU size, we use a 3-parameter equivalence scale.³

Decomposing changes in inequality

To examine how changing consumption patterns affected consumption inequality during COVID, we decompose inequality first by sources of consumption and then by demographic subgroups. The Gini decomposition is based on the method of Lerman and Yitzhaki (1989) for estimating the Gini coefficient from weighted individual (or CU) level data. As noted earlier, for our analysis, CU level data are converted to adult equivalized level data. The data are weighted at

³ The same equivalence scale used in the production of SPM thresholds; see <https://www.bls.gov/pir/spmhome.htm#threshold>; scales based on research of David Betson (1996). "Is Everything Relative?" The Role of Equivalence Scales in Poverty Measurement David M. Betson University of Notre Dame. Available at <https://aspe.hhs.gov/sites/default/files/private/pdf/106776/escale.pdf>

the person level, CU weight (FINLWT21) times CU size. This weighting procedure is equivalent to assigning each person within a CU the same adult equivalized consumption as well as rank within the distribution. Each person within a CU receives the same adult equivalent consumption and are weighted using both the CU weight (FINLWT21) and CU size. All individuals within the same CU are ranked as ties. The Gini coefficient for consumption (c) is given by:

$$G = 2 \text{cov}(c, F(c)) / \bar{c}$$

Where $F(c)$ is the cumulative consumption distribution and \bar{c} is the mean. If the weight for CU i is given by w_i (based on the CU weight and CU size) and CUs are ordered in increasing order of adult equivalized consumption, then the cumulative distribution can be estimated as:

$$\hat{F}_i(c) = \sum_{j=0}^{i-1} w_j + \frac{w_i}{2}$$

Then, the Gini for weighted adult equivalized “individual” level data, where c_i is adult equivalized level consumption, is given by:

$$G = 2 \sum_i^N w_i (c_i - \bar{c})(\hat{F}_i(c) - \bar{F}) / \bar{c}$$

The Gini coefficient can be decomposed based on the sources of consumption. Following Lerman and Yitzhaki (1985), let g denote the different consumption categories, then the overall Gini can be decomposed as:

$$G = \sum_g G_g R_g S_g$$

The first term is the Gini coefficient of consumption category g (G_g) is given by:

$$G_g = 2 \text{cov}(c_g, F_g) / \bar{c}_g$$

The second term is the Gini correlation of consumption category g . This term is given by:

$$R_g = \frac{\text{cov}(c_g, F)}{\text{cov}(c_g, F_g)}$$

The final term in the decomposition is share of category g in overall consumption and is given by:

$$S_g = \frac{\bar{c}_g}{\bar{c}}$$

The other measure of inequality that we consider is the Theil coefficient, which is one of the family of generalized entropy inequality indexes. The Theil coefficient is given by:

$$Theil = \left(\frac{1}{n}\right) \sum_{i=1}^n \left(\frac{c_i}{\bar{c}}\right) \log \left(\frac{c_i}{\bar{c}}\right)$$

An advantage of the generalized entropy family of indexes is that they are additively separable (Shorrocks 1980), while this is not a characteristic of the Gini. Let k denote the population subgroups, then the Theil index can be decomposed as:

$$Theil = \sum_k \left(\frac{\bar{c}_k n_k}{\bar{c} n}\right) * Theil_k + \left(\frac{1}{n}\right) \sum_k n_k \left(\frac{\bar{c}_k}{\bar{c}}\right) \log \left(\frac{\bar{c}_k}{\bar{c}}\right)$$

The first term measures within-group inequality, and the second term measures the between-group inequality. For an early example of the Gini decomposition for U.S. expenditure inequality see Garner (1993).⁴ Similar to the current study, Garner and Terrell (1998) decompose inequality by source and demographics to study changes in inequality during a large macroeconomic disruption. Instead of COVID, they study the post-Soviet transition in the Czech and Slovak Republics.

Results

Inequality from 2019-2022

In this section we discuss the trends in inequality for consumption from 2019 to 2022. For comparison, we also consider the inequality trends for equivalized post-tax income based on the CPS-ASEC published by the Census Bureau.

Table 1 presents the summary statistics for quarterly equivalized consumption. Nominal average consumption increased by approximately 20 percent from 2019 to 2022. Inflation, as measured by the chained CPI increased by 13.7 percent, so average real consumption only increased by 5.7 percent.

Table 1. Summary Statistics (in U.S. \$ except N)

	2019	2020	2021	2022
Mean	10041	10013	10926	12069
SD	5255	5035	5665	6253
Min	346	555	779	461
Max	131481	102275	128371	134626
N	21280	20158	20406	19181

Table 2 presents the Gini coefficient for consumption as well as the Gini for CPS-ASEC post tax income. Also presented are the 90:10, 50:10, and 90:50 ratios, the Theil index, and mean log

⁴ Gini decomposition was conducted for CU level expenditures and CU weights as opposed to adult equivalized expenditures and person level weights.

deviation for consumption. For comparison, we also present the inequality statistics for consumption with no cap for the health insurance value. Consumption is much more equally distributed than post tax income.⁵ Both consumption and post tax income become more equally distributed in 2020 compared to 2019. In 2021, post tax income becomes more equally distributed than 2020 before increasing in 2022 to pre-pandemic levels of inequality. Consumption becomes less equally distributed in 2021 and 2022 compared to 2020. Based on the standard errors of the consumption Gini, only 2020 is statistically different than 2019.⁶ Capping health insurance leads to slightly higher consumption inequality, however, there is no effect on the change in inequality over the period as inequality for both consumption with health insurance capped and uncapped follow the same pattern.

Table 2. Inequality Statistics				
	2019	2020	2021	2022
CPS ASEC Post Tax Income, equivalized				
Gini	0.416	0.399	0.394	0.417
Consumption, equivalized				
Gini	0.250 (0.003)	0.241 (0.003)	0.246 (0.004)	0.248 (0.004)
Mean log deviation	0.104	0.098	0.101	0.102
Theil	0.110	0.102	0.107	0.108
90:10 ratio	3.006	2.893	2.942	2.965
50:10 ratio	1.717	1.699	1.707	1.718
90:50 ratio	1.751	1.703	1.724	1.726
Consumption, equivalized, Health Insurance Uncapped				
Gini	0.248 (0.003)	0.239 (0.003)	0.244 (0.004)	0.246 (0.004)
Mean log deviation	0.102	0.097	0.100	0.101
Theil	0.108	0.101	0.106	0.106
90:10 ratio	2.971	2.865	2.923	2.938
50:10 ratio	1.710	1.695	1.706	1.711
90:50 ratio	1.737	1.69	1.714	1.717
Note: CPS ASEC post tax income from Shrider, et al (2021); Semega and Kollar (2022); and Guzman and Kollar (2023)				

⁵ Meyer and Sullivan (2023) present inequality results through 2017. The 90:10 ratio for their measure in 2017 is 3.7. The difference between the 90:10 measure in 2019 is likely due to differences in scope between the measures. Our measure includes health insurance and includes in-kind benefit programs that are not included in Meyer and Sullivan (2023). These scope differences lead consumption to be more equally distributed.

⁶ Standard errors are calculated using bootstrapping and are based on CE replicate weights

The next table presents the quintile shares and top 5 percent share for consumption and post-tax income for each of the years. Consumption has a larger lowest quintile share and a smaller highest quintile share compared to post tax income. The changes in quintile shares over time is similar to the changes in the overall Ginis. The lowest quintile share of consumption only increased slightly in 2020. The reduction in consumption inequality in 2020 is mostly due to an increase in the 2nd quintile share.

Table 3. Shares of Total

	2019	2020	2021	2022
CPS ASEC Post Tax Income, equivalized				
Lowest Quintile	4.7%	5.1%	5.4%	4.5%
2nd Quintile	10.4%	10.9%	10.9%	10.5%
3rd Quintile	15.7%	16.0%	16.0%	15.8%
4th Quintile	22.6%	22.8%	22.6%	22.6%
Top Quintile	46.6%	45.2%	45.1%	46.6%
Top 5 Percent	19.9%	18.9%	19.0%	19.9%
Consumption, equivalized				
Lowest Quintile	9.7%	9.9%	9.8%	9.8%
2nd Quintile	14.3%	14.7%	14.5%	14.5%
3rd Quintile	17.9%	18.1%	18.0%	17.9%
4th Quintile	22.3%	22.3%	22.2%	22.1%
Top Quintile	35.8%	35.1%	35.5%	35.7%
Top 5 Percent	13.5%	13.1%	13.4%	13.5%
Note: CPS-ASEC Post tax income from Shrider, et al (2021); Semega and Kollar (2022); and Guzman and Kollar (2023)				

Decomposition of Consumption Inequality

In this section, we present the results of the Gini decomposition by category of consumption and the Theil decomposition for select demographic groups: family type, race/ethnicity, economic status of household head, and geography. For the decomposition by category of consumption we break overall consumption into the following categories: food at home, food away from home, apparel, shelter – primary residence, shelter – other than primary residence, shelter – school, utilities, flow of services from vehicles, transportation excluding flow of services from owned vehicles, entertainment fees and tickets, entertainment other, health insurance, in-kind benefits, and other. Overall consumption inequality is decomposed into: 6 family subgroups: single, married with no children, single with own children, married with own children, married with not own children and/or other CU members, and other; 4 race/ethnicity subgroups: white non-Hispanic, black non-Hispanic, Hispanic, and other; and 4 subgroups for the economic status of the CU head: employed, unemployed, retired, and other. We also do the decomposition by geography using the 4 Census regions, 9 Census Divisions, and the 4 Census categories for urban/rural (central city of a CBSA, balance of an urban area outside of the

central city, other urban, and rural). These demographic characteristics were chosen because we hypothesize that certain subgroups were more impacted by the State and Federal response to COVID, such as business closures and pandemic related benefits. Geography was also included in the list of demographics because there was significant heterogeneity in the policy response to COVID across the U.S.

Table 4 (presented at the end of the paper) presents the Gini decomposition results for each of the years. For each year and category of consumption, the table presents the consumption share (S), the consumption category Gini (G), and the correlation with the rank of consumption (R). When looking at the correlation with the rank of consumption, shelter primary and shelter away have the strongest correlations with overall consumption. In-kind benefits and shelter at school have negative correlations, meaning that low overall consumption CUs are more likely to have higher consumption levels of these categories. For the category Gini coefficients, shelter away, other entertainment, apparel, and utilities have the largest within category Gini coefficients. These end up contributing to overall inequality because these categories have a positive correlation with overall consumption, meaning that people with high consumption in these categories tend to have high overall consumption. Shelter at school and in-kind benefits also have large category Ginis, but this is due to many CUs having zero consumption in these categories. Since these categories have negative correlation with overall consumption, these end up reducing overall inequality as households with positive shelter at school and in-kind benefits tend to have lower consumption. The consumption shares of food away from home, shelter away from primary, entertainment, and apparel had large decreases from 2019 to 2020 as these are the categories that were most affected by the pandemic.

Table 5 (presented at the end of the paper) presents the overall contribution to inequality by consumption category. The overall contribution to the Gini is given by $R \cdot S \cdot G$ for each category. Since the Gini changes each year, we present 2 normalizations to make the across year comparisons easier. The first is to convert the overall contribution to Gini into a percentage by dividing by the overall Gini for each year. The second normalization is to scale by the consumption share. If this term is greater than 1, the category contributes more to the Gini than its share of consumption. Shelter away from primary and other entertainment have the largest relative shares. Both categories contribute to the overall Gini at over twice their share of consumption. The categories with the lowest relative contributions are health insurance and the flow of services from owned vehicles. From 2019 to 2020, the categories that had a decrease in their relative share was food away from home, shelter away from primary, entertainment – tickets and fees, and apparel. The relative share contribution of these categories to overall inequality recovered in 2021 and 2022.

The decline in inequality in 2020 can be explained by decreased spending in pandemic sensitive categories that contribute a large amount to inequality relative to their share of consumption. However, offsetting this decline is that the categories gaining expenditure share also contribute to inequality. For example, shelter – primary residence's relative contribution is similar in 2019

and 2020, but it contributes 0.005 more to the overall Gini in 2020 due to its share of expenditure increasing. However, the categories with declining spending shares have greater relative contribution to inequality. So, the shift in spending from shelter away from primary residence and entertainment – tickets and fees to primary shelter decreases overall inequality.

In-kind benefits reduce overall inequality, but do not explain the change in inequality over this period as the in-kind contribution to overall inequality is similar each year. This is despite the expansion of the National School Lunch Program (NSLP) during the pandemic. Since the beneficiaries of the expansion represent a particular type of consumer unit (those with school age children), this is one area where a demographic decomposition of inequality would be more useful rather than a decomposition by source. We now turn to the demographic decomposition of the Theil Index.

Table 6 presents the decomposition of overall inequality by demographic characteristics. Overall inequality is divided into within-group inequality and between-group inequality. As noted earlier, the demographic characteristics we consider include family type, race and ethnicity, economic activity of household head, geography (Census Region and Census Division), and Census’ designation of urban/rural. Regardless of demographic breakdown considered, the vast majority of overall inequality can be explained by within-group inequality rather than between-group inequality.

Table 6. Within-Group and Between-Group Consumption Inequality: 2019 through 2022

	2019	2020	2021	2022
Thiel Index (Aggregate Inequality)	0.110	0.102	0.107	0.108
Family Type				
Within-group inequality share	83.5%	84.5%	86.0%	85.5%
Between-group inequality share	16.5%	15.5%	14.0%	14.5%
Race and Ethnicity				
Within-group inequality share	92.4%	92.4%	91.9%	93.1%
Between-group inequality share	7.6%	7.6%	8.1%	6.9%
Economic Activity of Household Head				
Within-group inequality share	95.1%	94.5%	96.0%	95.8%
Between-group inequality share	4.9%	5.5%	4.0%	4.2%
Census Region				
Within-group inequality share	98.0%	97.9%	97.5%	97.6%
Between-group inequality share	2.0%	2.1%	2.5%	2.4%
Census Division				
Within-group inequality share	96.9%	96.8%	96.5%	96.5%
Between-group inequality share	3.1%	3.2%	3.5%	3.5%
Census’ urban/rural categories				
Within-group inequality share	98.3%	99.4%	98.7%	98.9%
Between-group inequality share	1.7%	0.6%	1.3%	1.1%

Similar to the Gini, overall inequality as measured by the Theil index fell in 2020 before partially recovering in 2021 and 2022. Of the characteristics considered, between group inequality is largest for family type and represents between 14 and 16.5 percent of overall inequality across the period. Between-group inequality for family type decreases in 2020 and continues to decrease in 2021 before increasing slightly in 2022. This likely reflects the impact of government assistance programs that target households with children.

The between group inequality for race and ethnicity accounts for between 7 and 8 percent of total inequality. Even though overall inequality falls from 2019 to 2020, the within and between group share for race and ethnicity is unchanged, suggesting that the initial impact of COVID on consumption was experienced equally across race and ethnic groups. The within group contribution increases in 2021 as overall inequality also increased, suggesting that the impact of the recovery from COVID was unequal across groups. However, the within group share declines in 2022, which suggests the groups that initially lagged did recover.

The decomposition by economic activity of household head is difficult to interpret. Unlike the other demographic characteristics considered which are relatively stable over time, the economic activity of the household head changes dramatically over the period as the number of household heads who were unemployed spiked during 2020. The results when looking at geography are similar whether the decomposition is by Census Regions or Census Divisions. Geography explains little of the overall inequality. The between group contribution changes little from 2019 to 2020 but increases in 2021 suggesting that the recovery from COVID was unequal across geographic areas. The urban/rural categories explain little of the overall inequality, though there is a decline in the between-group inequality share in 2020.

Conclusion and Future Work

Consumption inequality fell in 2020 with the onset of the pandemic before recovering in 2021 and 2022. In this paper, we present decomposition results which shed some light on the drivers behind the changes in consumption inequality during this period. First, we decompose the Gini coefficient by type of consumption. The decline in inequality in 2020 was due to a reduction in consumption, disproportionately at the top of the distribution, in the categories that were most impacted by the pandemic such as shelter other than primary residence, entertainment – tickets and fees, and food away from home. As consumption in these categories recovered, consumption inequality returned closer to 2019 levels.

The decomposition by demographic results is less clear and points to the need for additional investigation. As expected, inequality across family types declined in 2020, which could be due to the various assistance programs that disproportionately targeted families with children. However, the inequality across family types never recovered, which we would expect as these

assistance programs expired. Another surprising result is that we find minimal effects of geography. There was a lot of geographic variation in the severity of the initial outbreak and the state's policy responses in terms of business and school closures. Also, industries like tourism that were most impacted by the pandemic are more important in some areas. One reason why we don't see much of an effect is that we are only considering broad geographic areas. In future work, we will consider finer geographic areas. Also, we will consider other demographic characteristics or interactions of characteristics.

Finally, there are improvements to the consumption measure that could affect the analysis of inequality. First, we currently only use the CE Interview survey. However, a small percentage of expenditures are only captured on the Diary survey. We plan to integrate the Diary expenditures in a future version of the measure. Also, there is a concern that expenditures at the top of the distribution are underrepresented in the CE. One way to account for this is to apply an adjustment to the top tail of the distribution as has been done for the CE-PCE distributional analysis (BLS 2023). This will change the overall level of consumption inequality, though it may not have a large impact on the trends over time as the effect of the adjustment should be similar each year.

References:

Aladangady, Aditya, Jesse Bricker, Andrew C. Chang, Sarena Goodman, Jacob Krimmel, Kevin B. Moore, Sarah Reber, Alice Henriques Volz, and Richard A. Windle (2023). "Changes in U.S. Family Finances from 2019 to 2022: Evidence from the Survey of Consumer Finances." Washington: Board of Governors of the Federal Reserve System, October, <https://doi.org/10.17016/8799>.

Autor, David, Arindrajit Dube, and Annie McGrew (2023). "The Unexpected Compression: Competition at Work in the Low Wage Labor Market." NBER Working Paper 31010.

Blanchet, Thomas, Emmanuel Saez, and Gabriel Zucman (2022). "Real-Time Inequality." NBER Working Paper 30229.

Bureau of Economic Analysis (2023). Distribution of Personal Income, December 2023 Update.

Bureau of Labor Statistics (2022). Consumer Expenditures in 2020. BLS report #1096. <https://www.bls.gov/opub/reports/consumer-expenditures/2020/home.htm>

Bureau of Labor Statistics (2023). Consumer Expenditures in 2021. BLS report #1101. <https://www.bls.gov/opub/reports/consumer-expenditures/2021/home.htm>

Bureau of Labor Statistics (2023). Distribution of Personal Consumption Expenditures, December 27 2022 update. <https://www.bls.gov/cex/pce-ce-distributions.htm>

Chetty, Raj, John N Friedman, Michael Stepner, and The Opportunity Insights Team (2023). "The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data." NBER working paper No 27431.

Foster, James, Joel Greer, and Erik Thorbecke (1984). "A Class of Decomposable Poverty Measures." *Econometrica*. Vol 52, No 3, 761-766.

Garner, Thesia I (1993). "Consumer Expenditures and Inequality: An Analysis Based on Decomposition of the Gini Coefficient." *The Review of Economics and Statistics*, 75(1), pp. 135-138.

Garner, Thesia I and Katherine Terrell (1998). A Gini Decomposition Analysis of Inequality in the Czech and Slovak Republics During the Transition. *The Economics of Transition*. Volume 6 , issue 1 , p. 23 – 46.

Garner, Thesia I., Brett Matsumoto, Jake Schild (2023). "An Analysis of Poverty through a Consumption Lens: Research from the U.S. Bureau of Labor Statistics." Presented at the Association for Public Policy Analysis and Management 2023 Fall Research Conference.

Garner, Thesia I., Brett Matsumoto, Jake Schild, Scott Curtin, and Adam Safir (2023). "Developing a Consumption Measure with Examples of Use for Poverty and Inequality Analysis: A New Research Product from BLS." *Monthly Labor Review*.

Guzman, Gloria and Melissa Kollar (2023). *Income in the United States: 2022*. U.S. Census Bureau, Current Population Reports, P60-279.
<https://www.census.gov/content/dam/Census/library/publications/2023/demo/p60-279.pdf>

Han, Jeehoon, Bruce D. Meyer, and James X. Sullivan (2023). Annual Report on U.S. Consumption Poverty: 2022. Working Paper.

Heathcote, Jonathan, Fabrizio Perri, Giovanni L. Violante, and Lichen Zhang (2023). "More Unequal We Stand? Inequality Dynamics in the United States 1967-2021." NBER Working Paper 31486.

Larrimore, Jeff, Jacob Mortenson, and David Splinter (2022). "Unemployment Insurance in Survey and Administrative Data," FEDS Notes. Washington: Board of Governors of the Federal Reserve System, July 5, 2022, <https://doi.org/10.17016/2380-7172.3135>.

Lerman, Robert I and Shlomo Yitzhaki (1985). "Income Inequality Effects by Income Source: A new approach and applications to the United States." *Review of Economics and Statistics*, Vol 67 No 1, 151-156.

Lerman, Robert I and Shlomo Yitzhaki (1989). "Improving the Accuracy of Estimates of Gini Coefficients." *Journal of Econometrics*. Vol 42, 43-47.

Meyer, Bruce D. and James X. Sullivan (2012). Winning the War: Poverty from the Great Society to the Great Recession. *Brookings Papers on Economic Activity*, Fall, 133-183.

Meyer, Bruce D. and James X. Sullivan (2023). "Consumption and Income Inequality in the United States since the 1960s. *Journal of Political Economy*. Vol 131, No 2, 247-284.

Semega, Jessica and Melissa Kollar (2022). Income in the United States: 2021. U.S. Census Bureau, Current Population Reports, P60-276.
<https://www.census.gov/content/dam/Census/library/publications/2022/demo/p60-276.pdf>

Shorrocks, A.F. (1980). "The Class of Additively Decomposable Inequality Measures." *Econometrica*. Vol 48, No 3, 613-625.

Shrider, Emily A. and John Creamer (2023). *Poverty in the United States: 2022*. U.S. Census Bureau, Current Population Reports, P60-280.

Shrider, Emily A, Melissa Kollar, Frances Chen, and Jessica Semega (2021). Income and Poverty in the United States: 2020. U.S. Census Bureau, Current Population Reports, P60-273.
<https://www.census.gov/content/dam/Census/library/publications/2021/demo/p60-273.pdf>

Shrider, Em. 2021. "Alternative School Lunch Valuation in the CPS ASEC During COVID-19." U.S. Census Bureau. <https://www.census.gov/library/working-papers/2021/demo/SEHSD-WP2021-20.html>

Williams, Elizabeth, Elizabeth Hinton, Robin Rudowitz, and Anna Mudumala (2023). "Medicaid Enrollment and Spending Growth Amid the Unwinding of the Continuous Enrollment Provision: FY 2023 & 2024." Kaiser Family Foundation. <https://www.kff.org/medicaid/issue-brief/medicaid-enrollment-and-spending-growth-amid-the-unwinding-of-the-continuous-enrollment-provision-fy-2023-2024/>

Additional Tables

Table 4a. Gini Decomposition for 2019 & 2020

	2019			2020		
	Correlation with Rank of Consumption (R)	Gini of Source (G)	Share of Total Consumption (S)	Correlation with Rank of Consumption (R)	Gini of Source (G)	Share of Total Consumption (S)
Food						
at Home	0.512	0.291	0.093	0.524	0.294	0.103
Away from Home	0.604	0.549	0.049	0.463	0.580	0.035
Shelter						
Primary	0.785	0.391	0.265	0.783	0.386	0.284
Away	0.706	0.923	0.009	0.615	0.957	0.005
School	-0.240	0.997	0.001	-0.178	0.999	0.000
Transportation						
Flows	0.535	0.300	0.061	0.540	0.289	0.063
Other	0.469	0.455	0.050	0.466	0.465	0.048
Entertainment						
Fees and Tickets	0.613	0.429	0.091	0.498	0.429	0.074
Other	0.636	0.837	0.011	0.614	0.905	0.006
Apparel	0.496	0.663	0.019	0.376	0.672	0.015
Utilities	0.601	0.607	0.026	0.583	0.619	0.028
Health Insurance	0.542	0.318	0.259	0.576	0.326	0.273
In-kind Benefits	-0.216	0.929	0.008	-0.172	0.976	0.006
Other	0.678	0.601	0.059	0.658	0.600	0.060

Note: All results are weighted as the person level (FINLWT21*CU Size).

Table 4b. Gini Decomposition for 2021 & 2022

	2021			2022		
	Correlation with Rank of Consumption (R)	Gini of Source (G)	Share of Total Consumption (S)	Correlation with Rank of Consumption (R)	Gini of Source (G)	Share of Total Consumption (S)
Food						
at Home	0.516	0.295	0.100	0.509	0.296	0.101
Away from Home	0.563	0.551	0.047	0.600	0.552	0.049
Shelter						
Primary	0.784	0.379	0.279	0.783	0.381	0.277
Away	0.650	0.923	0.009	0.697	0.913	0.010
School	-0.198	0.998	0.000	-0.281	0.999	0.000
Transportation						

Flows	0.521	0.305	0.059	0.512	0.304	0.057
Other	0.444	0.442	0.043	0.459	0.427	0.045
Entertainment						
Fees and Tickets	0.570	0.431	0.083	0.611	0.437	0.094
Other	0.668	0.883	0.010	0.638	0.844	0.011
Apparel	0.397	0.596	0.018	0.409	0.607	0.018
Utilities	0.632	0.660	0.030	0.619	0.656	0.026
Health Insurance	0.526	0.321	0.249	0.508	0.323	0.241
In-kind Benefits	-0.261	0.905	0.008	-0.262	0.872	0.009
Other	0.689	0.605	0.065	0.697	0.601	0.062

Note: All results are weighted as the person level (FINLWT21*CU Size).

Table 5a. Gini Contribution by Source 2019 and 2020

	2019			2020		
	Contribution to Overall Gini (R*G*S)	Share of Overall Gini (R*G*S)/Gini	Relative Share of Overall Gini (R*G*S)/(Gini*S)	Contribution to Overall Gini (R*G*S)	Share of Overall Gini (R*G*S)/Gini	Relative Share of Overall Gini (R*G*S)/(Gini*S)
Food						
at Home	0.014	5.5%	0.597	0.016	6.6%	0.639
Away from Home	0.016	6.4%	1.327	0.009	3.9%	1.112
Shelter						
Primary	0.081	32.6%	1.229	0.086	35.6%	1.253
Away	0.006	2.4%	2.606	0.003	1.1%	2.438
School	0.000	-0.1%	-0.956	0.000	0.0%	-0.736
Transportation						
Flows	0.010	3.9%	0.642	0.010	4.1%	0.647
Other	0.011	4.3%	0.854	0.010	4.3%	0.898
Entertainment						
Fees and Tickets	0.024	9.6%	1.050	0.016	6.5%	0.885
Other	0.006	2.3%	2.130	0.003	1.5%	2.304
Apparel	0.006	2.4%	1.316	0.004	1.6%	1.046
Utilities	0.009	3.7%	1.461	0.010	4.1%	1.497
Health Insurance	0.045	17.9%	0.689	0.051	21.3%	0.778
In-kind Benefits	-0.002	-0.6%	-0.804	-0.001	-0.4%	-0.696
Other	0.024	9.7%	1.629	0.024	9.9%	1.636

Note: All results are weighted as the person level (FINLWT21*CU Size).

Table 5b. Gini Contribution by source for 2021 and 2022

	2021			2022		
	Contribution to Overall Gini (R*G*S)	Share of Overall Gini (R*G*S)/Gini	Relative Share of Overall Gini (R*G*S)/(Gini*S)	Contribution to Overall Gini (R*G*S)	Share of Overall Gini (R*G*S)/Gini	Relative Share of Overall Gini (R*G*S)/(Gini*S)
Food						
at Home	0.015	6.2%	0.620	0.015	6.2%	0.609
Away from						
Home	0.015	5.9%	1.259	0.016	6.5%	1.337
Shelter						
Primary	0.083	33.7%	1.207	0.083	33.4%	1.205
Away	0.005	2.2%	2.435	0.007	2.7%	2.568
School	0.000	0.0%	-0.803	0.000	0.0%	-1.135
Transportation						
Flows	0.009	3.8%	0.646	0.009	3.6%	0.629
Other	0.008	3.4%	0.798	0.009	3.5%	0.791
Entertainment						
Fees and Tickets	0.020	8.3%	0.998	0.025	10.1%	1.078
Other	0.006	2.3%	2.399	0.006	2.3%	2.175
Apparel	0.004	1.8%	0.961	0.004	1.8%	1.004
Utilities	0.012	5.1%	1.694	0.011	4.3%	1.640
Health Insurance	0.042	17.1%	0.687	0.040	16.0%	0.662
In-kind Benefits	-0.002	-0.8%	-0.960	-0.002	-0.8%	-0.923
Other	0.027	11.1%	1.695	0.026	10.5%	1.692

Note: All results are weighted as the person level (FINLWT21*CU Size).