

# PERSPECTIVES ON OPPORTUNITY

## The Cost of Thriving Has Fallen: Correcting and Rejecting the American Compass Cost-of-Thriving Index

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The Cost-of-Thriving Index (COTI), developed by American Compass Executive Director Oren Cass, asks whether families can afford a middle-class lifestyle. It compares the costs of five goods and services to the income of a typical full-time male earner. Cass concludes that the cost of thriving has increased dramatically, from 40 weeks of work in 1985 to 62 in 2022. Our improvements to Cass's estimates indicate the cost of thriving rose by 10 weeks rather than 22. After accounting for the better quality of the goods and services he tracks, the increase was four weeks. The cost of thriving declines when we account for falling federal taxes or include all full-time workers. The after-tax cost of thriving for this broader group fell by 7.5 weeks. These improvements aside, we reject the COTI approach as inadequate for assessing changes in living standards. While Cass's estimates imply that male earnings have fallen by 36 percent relative to costs, conventional analyses indicate a rise of 19 percent, without accounting for taxes, and an increase of 34 percent after taxes. For the broader group including all full-time workers, the after-tax increase was 53 percent.

Can US families still afford a middle-class lifestyle? The Cost-of-Thriving Index (COTI), developed by American Compass Executive Director Oren Cass, is an attempt to answer that question (Cass 2023). Specifically, COTI asks whether a male earner's paycheck can afford the same five middle-class goods and services that it could purchase in 1985.

For 2022, Cass's answer to that question is a strong "no": It would take more weeks than there are in a year for the median man to afford the basic middle-class goods and services: groceries, a home, health insurance, an automobile, and a college education for his children. In 1985, these items were in reach for a male earner working roughly 40 weeks according to COTI. In Cass's telling

of the subsequent history, it would have taken 62 weeks to purchase these items in 2022, which is problematic considering there are only 52 weeks in a year.

In this report, we object to Cass's numbers on both empirical and theoretical grounds. We find that Cass overstates the increase in all these costs—and dramatically so for some of them. Making appropriate adjustments to Cass's figures, we find that it has become easier for a male earner to support a family than it was in 1985.

We correct the dollar costs of the COTI components when there are obvious errors (as is the case for health insurance costs), use better data when we can find them (as for higher education costs), and correct conceptual problems in defining costs (as with homeowners' costs of housing).

We find that instead of rising by 22 weeks of work, the cost of thriving (for male workers) rose by just over 10 weeks.

This improved estimate overstates the increase in COTI, however. Cass’s way of measuring “costs” fails to account for quality improvement in the items he tracks—particularly better health care and nicer cars. According to our preferred estimates, the cost of thriving rose by less than four weeks of work.

It is likely that even our preferred estimate overstates the increase in housing, health care, and education costs by failing to account fully for quality improvements. The ideal estimates would probably erase that four-week increase.

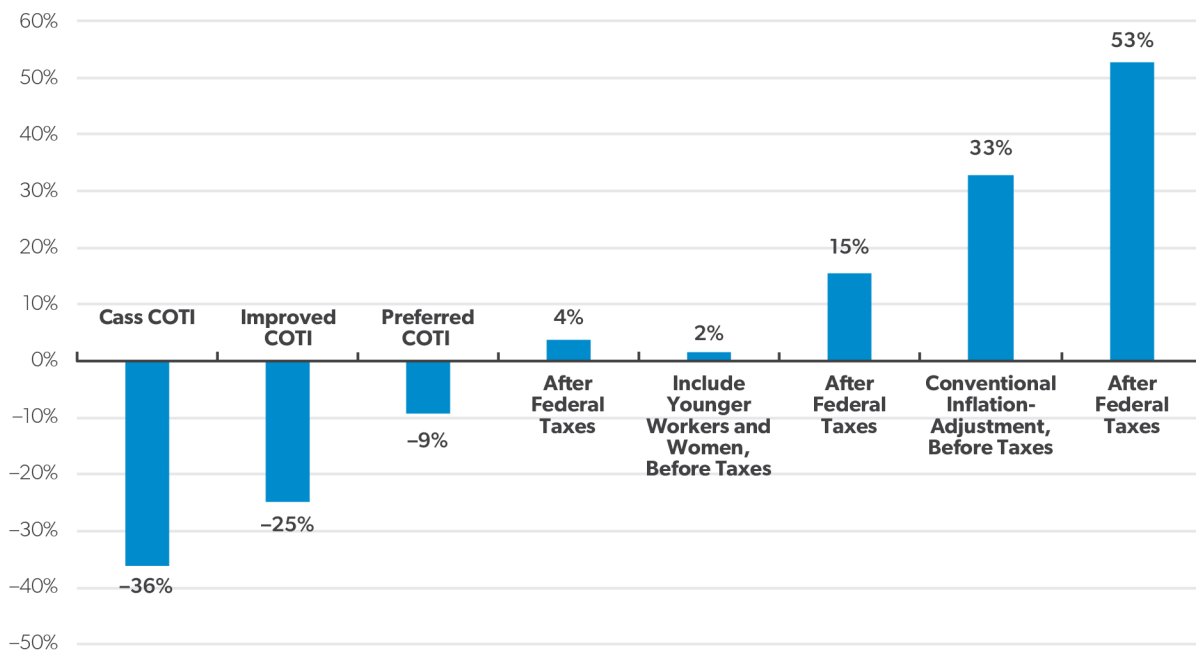
Furthermore, COTI does not take into account taxes—a major flaw. Taxes can be a major cost for many families when considering their ability to thrive, so including them is important. But it’s especially important in this case because the kind of family Cass is describing has seen a major reduction in its federal tax burden since 1985, going from a net taxpayer to receiving a subsidy, primarily due to the child tax credit (CTC). After including estimates of the federal tax burden or tax subsidy in both years, we find that the 2022 cost of thriving for a family

with one male earner is lower than it was in 1985.

When we include younger full-time workers excluded by Cass and full-time female workers, COTI falls by nearly one week before accounting for taxes and by 7.5 weeks after taking them into account.

Moreover, assessing changes in family affordability in this way, no matter how carefully done, hides improvement over time. While Cass objects to standard inflation adjustment of earnings as a way to assess changes in the cost of living, his position reflects a basic misunderstanding about the methodology involved. Inflation adjustment is a more accurate way of assessing changes in living standards than is Cass’s approach. While Cass’s estimates suggest that the purchasing power of the median man’s earnings fell by 36 percent, and our corrections indicate an increase of 4 percent after accounting for taxes, conventional inflation adjustment shows that earnings actually rose by 19 percent before taxes and 34 percent after taxes. Adding women and younger workers, the pretax increase is 33 percent, and the posttax increase is 53 percent. (Figure 1 summarizes the various estimates of the change in purchasing power presented below.)

**Figure 1. Change in Cost-Adjusted Earnings of Full-Time Workers, 1985–2022**



Note: The values for the first three bars are taken from Table 1, row 9. The value for the fourth bar is taken from Table 1, row 14. The value for the fifth bar comes from Table 2, row 9, and the value for the sixth bar is from Table 2, row 14. The values for the last two bars come from Table 2, rows 10 and 15.

Source: Cass (2023); and authors’ calculations as described in Appendix A.

## Correcting COTI

Cass introduced COTI in early 2020, finding that between 1985 and 2018, the cost of thriving rose from 30 weeks of work at the earnings of the median male full-time worker to 53 weeks (Cass 2020). The latest version uses 2022 estimates and includes five categories of needs rather than the original four. (Groceries are the new category.) Table 1 compares the Cass cost estimates for each of his five categories—in 1985 and 2022—to estimates we label “improved” and “preferred.” The latter build on the “improved” estimates by incorporating the methodological benefits of inflation adjustment, as we discuss below.

**Results Before Taxes.** Cass’s basic results are summarized in the first three columns at Table 1, row eight, which is labeled “COTI.” COTI takes the sum of the five costs he estimates (shown in rows two through six and summed in row seven) and divides it by his weekly earnings estimate (row one). The result is the number of weeks required for the median male full-time worker to afford Cass’s budget. The index rose from 39.7 weeks in 1985 to 62.1 in 2022,

an increase of 22.4 weeks, or 56 percent. Cass estimates that the cost of his budget rose by 331 percent over this period—more than quadrupling (row seven). In contrast, median male earnings rose by only 175 percent (row one). These dollar amounts are all in nominal terms—that is, not adjusted for inflation—because Cass rejects conventional inflation adjustment and is using his alternative approach to assess the change in the cost of living.

The second set of columns in Table 1 shows our “improved” results (described in detail in Appendix A). For housing and education costs, we find smaller increases over time than Cass did (rows four and six in the “Percentage Change” column). Moreover, for transportation, housing, and health care costs, we find that costs are significantly lower in both 1985 and 2022 than Cass estimates (though the increases in transportation and health care costs are similar to what he finds). Overall, we find that the cost of the budget items Cass considered rose by 266 percent rather than 331 percent (row seven). COTI rose 33 percent, from 31.4 weeks to 41.7 weeks, the 10.3-week rise being less than half that estimated by Cass (row eight).

**Table 1. Changes in the Cost of Living, 1985–2022, Limited to Men Age 25 and Older and Working Full-Time**

		Cass			Improved			Preferred		
		1985	2022	Percentage Change	1985	2022	Percentage Change	1985	2022	Percentage Change
<b>1</b>	Weekly Earnings	443	1,219	175%	443	1,219	175%	443	1,219	175%
<b>2</b>	Food	4,550	13,667	200%	4,498	13,293	196%	5,335	13,293	149%
<b>3</b>	Transportation	3,484	10,729	208%	2,119	6,383	201%	2,744	6,383	133%
<b>4</b>	Housing	5,560	18,204	227%	4,525	12,234	170%	4,525	12,234	170%
<b>5</b>	Health Care	2,152	22,463	944%	920	9,684	953%	2,345	9,684	313%
<b>6</b>	Education	1,841	10,669	480%	1,846	9,250	401%	1,846	9,250	401%
<b>7</b>	<b>Subtotal</b>	17,587	75,732	331%	13,908	50,843	266%	16,795	50,843	203%
<b>8</b>	COTI	39.7	62.1	56%	31.4	41.7	33%	37.9	41.7	10%
<b>9</b>	Cost-Adjusted Earnings			-36%			-25%			-9%
<b>10</b>	Conventional Cost-Adjusted Earnings			19%			19%			19%
<b>11</b>	Net Tax	0	0	0%	3,760	3,736	-1%	3,760	3,736	-1%
<b>12</b>	<b>Total</b>	17,587	75,732	331%	17,668	54,579	209%	20,555	54,579	166%
<b>13</b>	COTI	39.7	62.1	56%	39.9	44.8	12%	46.4	44.8	-4%
<b>14</b>	Cost-Adjusted Earnings			-36%			-11%			4%
<b>15</b>	Conventional Cost-Adjusted Earnings			34%			34%			34%

Source: Cass (2023); and authors’ calculations as described in Appendix A.

Our “preferred” results are displayed in the third set of columns. The preferred estimates for 2022 are the same as our improved estimates. The changes we make are to the 1985 estimates for food, transportation, and health care, using price indexes to adjust the 2022 costs downward to obtain 1985 costs. (Appendix C discusses the use of price indexes to measure the change in the cost of living, detailing Cass’s misunderstanding of the methodological issues involved.)

We find that costs rose by significantly less than Cass estimates in every category except education. (Moreover, as discussed in Appendix A, our housing and education estimates likely overstate the true increase in costs.) Rather than Cass’s 331 percent rise in costs, we find an increase of 203 percent. That translates into a 3.8-week increase in the COTI (from 37.9 weeks to 41.7 weeks)—far smaller than the 22.4-week increase Cass finds.

**Results After Taxes.** In row 11, for the improved and preferred analyses, we provide estimates of the federal income and payroll taxes that the median male full-time earner—as a sole breadwinner—would pay in 1985 and 2022. Strikingly, despite earnings rising 175 percent, federal tax liability was essentially unchanged *in nominal dollar terms* over the period.<sup>1</sup> While payroll tax liability rose slightly (from 7.05 percent to 7.65 percent), the effective income tax rate fell from 9 percent to –1 percent. That is, the typical full-time male earner in 2022 received a check from the IRS if he was the sole breadwinner, rather than having to pay income taxes, thanks to the CTC (introduced in 1998 and increased several times in subsequent years).

Adding federal taxes as a sixth budget item, costs rose by 209 percent according to our improved estimates and by 166 percent according to our preferred estimates (row 12). The latter is less than the 175 percent increase in earnings, so COTI falls by 1.6 weeks (row 13). In results not shown in Table 1, we also estimated COTI by dividing the five nontax costs by after-tax earnings. The preferred estimates fell by one week, from 45.3 to 44.3 weeks.

**Results Including Women and Younger Full-Time Workers.** Cass says that “the Index measures the number of weeks a typical worker would need to work in a given

year to earn enough income to cover the major costs for a family of four in the American middle class” (Cass 2023, 1). In truth, his estimates apply to the typical *male* worker who is at least 25 years old and works full-time. So far, we have followed Cass in restricting our analyses to this group. Limiting the scope to full-time workers is useful because it prevents the results from being unduly affected by changes in employment and in hours worked that have arisen due to rising school enrollment among younger adults and earlier retirement among older adults. But once we focus on full-time workers, it makes little sense to exclude younger men (who are unlikely to be in school).

Nor does it make sense for purposes of assessing whether things are more affordable than in the past to neglect the 40–45 percent of full-time workers who happen to be women (BLS 2015). Cass provides estimates for women, but the 2023 paper, like the earlier paper from 2020, focuses on men. Cass offers no justification for this in the latest paper, though the 2020 version cited several considerations.

For example, Cass says that looking at men rather than women “hold[s] constant the economic experience of a group that traditionally has been recognized as the family breadwinner” (Cass 2020, 17). In contrast, including men and women, Cass implies, would overstate declines in affordability because women—earning less, on average, than men—have increased as a share of the full-time workforce. However, because women’s earnings have risen by more than men’s earnings, the median full-time worker’s earnings rose faster from 1985 to 2022 when women are included.

Table 2 compares Cass’s results to our improved and preferred estimates when we include all full-time workers at least 16 years old, whether male or female. Row one shows that median earnings for this group rose by 208 percent rather than the 175 percent increase in the original Cass sample. Rows two through seven are identical to the corresponding rows in Table 1. Our preferred estimates indicate COTI fell slightly even before accounting for taxes (row eight). Federal taxes for this expanded sample fell by 71 percent over time due to not only falling rates and the CTC but also the earned income tax credit, which was expanded over the years, particularly in

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<sup>1</sup> Scott Winship’s analyses of the Annual Social and Economic Supplement to the Current Population Survey suggest that median and mean state income tax rates changed little over this period. Property taxes of homeowners are included in our “improved” and “preferred” housing costs in Tables 1 and 2.

1986 and 1993 (row 11). As a result, after accounting for federal taxes, the COTI fell by 7.5 weeks, from 56.2 to 48.7 weeks (row 13).

## Rejecting COTI

Cass’s analyses, then, overstate the cost of thriving and its increase over time. We believe our analyses unambiguously improve on his. However, we reject that the COTI approach is the right way to assess changes in living standards, the cost of living, affordability, or, indeed, the cost of thriving. Instead, we side with the economists who have developed price theory and measurement over the past century. Cass explicitly rejected this approach in the 2020 paper that introduced COTI. In Appendix C, we refute his rejection of conventional inflation adjustment and his rejection of the inflation measure we use below, and we describe more general problems with the COTI approach that add to the specific flaws we identified above.

Economists tend to evaluate changes in the cost of living as follows. They use social scientific surveys to assess the relative amounts spent on the whole array of categories of goods and services that American

households buy. They use a monthly survey that covers a variety of communities and retail outlets across the US to price out hundreds of categories of goods and services. Then they track how much the cost of categories of purchases in different communities changes over time, aggregating these inflation indexes in proportion to the share of spending they represent among Americans.

The consumer bundle that is priced changes every few years to reflect changes in what Americans purchase and their relative proportions. In the meantime, prices are continuously collected for the same items in a bundle. When an item is no longer sold (because there is no longer demand for it), it is replaced with a similar item. An imperfect quality adjustment is conducted to reflect that the price of the slightly different good reflects a change in quality too. Measures of inflation worth their salt also adjust price changes to account for the fact that when the price of one category of goods goes up, consumers can substitute other categories of goods, switching around their purchases so as to reduce the diminishment of their satisfaction (or utility). If the cost of Red Delicious apples goes up, consumers

**Table 2. Changes in the Cost of Living, 1985–2022, All Full-Time Workers**

	Cass			Improved			Preferred		
	1985	2022	Percentage Change	1985	2022	Percentage Change	1985	2022	Percentage Change
<b>1</b> Weekly Earnings	443	1,219	175%	344	1,059	208%	344	1,059	208%
<b>2</b> Food	4,550	13,667	200%	4,498	13,293	196%	5,335	13,293	149%
<b>3</b> Transportation	3,484	10,729	208%	2,119	6,383	201%	2,744	6,383	133%
<b>4</b> Housing	5,560	18,204	227%	4,525	12,234	170%	4,525	12,234	170%
<b>5</b> Health Care	2,152	22,463	944%	920	9,684	953%	2,345	9,684	313%
<b>6</b> Education	1,841	10,669	480%	1,846	9,250	401%	1,846	9,250	401%
<b>7</b> <b>Subtotal</b>	17,587	75,732	331%	13,908	50,843	266%	16,795	50,843	203%
<b>8</b> COTI	39.7	62.1	56%	40.4	48.0	19%	48.8	48.0	-2%
<b>9</b> Cost-Adjusted Earnings			-36%			-16%			2%
<b>10</b> Conventional Cost-Adjusted Earnings			33%			33%			33%
<b>11</b> Net Tax	0	0	0%	2,534	724	-71%	2,534	724	-71%
<b>12</b> <b>Total</b>	17,587	75,732	331%	16,442	51,567	214%	19,329	51,567	167%
<b>13</b> COTI	39.7	62.1	56%	47.8	48.7	2%	56.2	48.7	-13%
<b>14</b> Cost-Adjusted Earnings			-36%			-2%			15%
<b>15</b> Conventional Cost-Adjusted Earnings			53%			53%			53%

Source: Cass (2023); and authors’ calculations as described in Appendix A.

can buy Granny Smith apples. The best inflation measures also adjust to account for substitution between, say, apples and pears.

With a well-measured index of inflation, then, one can compare the change in income to the change in the cost of living and determine whether the cost of supporting a family has gone up. This scientific approach—the consensus approach among economists, developed over 100 years—solves (or at least attempts to solve) the central problems with Cass’s preferred method. (See Appendix C for more details.) In fact, it usually solves them imperfectly and in such a way that the increase in the cost of living is overstated.

**Results from Conventional Analyses.** To see how Cass’s analyses understate improvement in living standards, COTI can be expressed in terms that make it more comparable to the conventional way of assessing changes in purchasing power. Instead of dividing the cost of Cass’s five needs by weekly earnings, we can divide weekly earnings by costs and then look at the change in “cost-adjusted” earnings. Mathematically, you get the same result if you compute the ratio of 2022 earnings to 1985 earnings and then divide by the ratio of 2022 costs to 1985 costs. Reported this way, according to COTI, the purchasing power of men’s earnings fell by 36 percent (row nine of Table 1).

Conventionally, economists would estimate inflation-adjusted earnings by dividing the ratio of 2022 earnings to 1985 earnings by the ratio of a price index value in 2022 to the value in 1985. If we use Cass’s weekly earnings amounts and the Bureau of Economic Analysis’s Personal Consumption Expenditures (PCE) deflator, we find that inflation-adjusted earnings rose by 19 percent (row 10).<sup>2</sup> Inflation-adjusted posttax earnings rose by 34 percent (row 15). Table 2 shows that when younger full-time workers and women are included, inflation-adjusted earnings rose 33 percent before taxes and 53 percent after taxes. In short, COTI presents a dramatically worse picture than does conventional analysis.

Why do these conventional results look more impressive even than our “preferred” results using the five

budget items Cass considers? The answer is that Cass has chosen items that have seen larger price increases than the full range of things Americans buy. We looked at household consumption expenditures, broken down by category in 1985 and 2019 (pre-pandemic) and price increases for the same categories over the same period.<sup>3</sup> Our analysis is presented in Table 3.

To start, we considered 10 categories that correspond to those Cass selected: food and nonalcoholic beverages purchased for off-premises consumption, motor vehicles, motor vehicle operation, net motor vehicle and other transportation insurance, rental of tenant-occupied nonfarm housing, imputed rental of owner-occupied nonfarm housing, rental value of farm dwelling, health, net health insurance for medical care and hospitalization, and higher education. These categories accounted for 52 percent of spending in 1985 and 56 percent of spending in 2019. This means that COTI excludes the prices of almost half of spending in the economy. Weighting the increase in prices across these categories by their relative share of 2019 spending within the set of categories, the overall rise was 192 percent. From Table 1, our preferred estimates indicate a similar increase of 203 percent from 1985 to 2022.

We then looked at spending on the remaining categories, again weighting the increase in prices by their relative share of 2019 spending within the set of these categories. The rise in price was just 85 percent—much smaller than the increase in the price of the goods Cass considered. The largest categories not covered by Cass (in descending order) were recreation (including most things people do for fun); food services and accommodations (primarily food eaten out); other goods and services (a catchall, including personal care); financial services; furnishings, household equipment, and routine household maintenance; clothing, footwear, and related services; household utilities and fuels; and communication. Only “other goods and services” saw a price increase larger than the 167 percent rise in the weekly earnings of full-time workers at least 16 years old from 1985 to 2019. The prices of recreation and communication both fell, while the prices of clothing, household furnishings, and household maintenance barely rose.

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2. If we use the unambiguously less-accurate Consumer Price Index (CPI), there is still a 1 percent increase. On the superiority of the Personal Consumption Expenditures (PCE) price index, see Winship (2016, 42–45).

3. These data come from BEA (2022b). Expenditures are from Table 2.5.5, and prices (using the chained PCE price index) are from Table 2.5.4. The most recent data available are for 2021, but we use 2019 to avoid issues to do with recent inflation.

**Table 3. COTI—What’s In? What’s Out? What’s the Difference?**

	Expenditures (Billions)		Budget Share		PCE Price Index (2012 = 100)		
	1985	2019	1985	2019	1985	2019	Change
<b>Included in COTI</b>							
Food and nonalcoholic beverages purchased for off-premises consumption	262.3	884.2	10%	6%	50.1	104.1	108%
Motor vehicles	146.6	439.5	6%	3%	70.8	98.4	39%
Motor vehicle operation	182.7	704.4	7%	5%	40.8	89.7	120%
Net motor vehicle and other transportation insurance	14.7	82.7	1%	1%	29.6	128.7	334%
Rental of tenant-occupied nonfarm housing	108.4	537.4	4%	4%	42.6	127.2	198%
Imputed rental of owner-occupied nonfarm housing	280.6	1,660.9	11%	12%	44.4	123.0	177%
Rental value of farm dwellings	5.1	22.1	0%	0%	29.4	115.3	293%
Health	345.3	3,078.9	13%	22%	34.3	110.6	222%
Net health insurance: Medical care and hospitalization	20.6	189.1	1%	1%	27.8	118.7	327%
Education: Higher education	22.3	188.5	1%	1%	17.1	123.1	621%
Subtotal (with rough price change)	1,388.6	7,787.7	52%	56%			192%
<b>Excluded from COTI</b>							
Alcoholic beverages purchased for off-premises consumption	39.7	146.1	1%	1%	56.2	106.3	89%
Food produced and consumed on farms	0.9	0.5	0%	0%	59.8	90.0	51%
Clothing, footwear, and related services	154.3	414.6	6%	3%	98.0	98.7	1%
Group housing	0.5	2.1	0%	0%	42.2	127.2	201%
Household utilities and fuels	119.3	371.1	4%	3%	46.4	110.1	138%
Furnishings, household equipment, and routine household maintenance	156.0	600.5	6%	4%	89.6	93.8	5%
Public transportation	28.1	184.3	1%	1%	58.4	105.7	81%
Communication	53.1	276.2	2%	2%	110.0	73.7	-33%
Recreation	207.2	1,254.1	8%	9%	109.5	94.6	-14%
Educational books	3.2	10.0	0%	0%	21.8	121.9	460%
Nursery, elementary, and secondary schools	9.5	50.9	0%	0%	20.3	126.6	523%
Commercial and vocational schools	6.2	56.2	0%	0%	30.5	115.3	278%
Food services and accommodations	174.3	1,009.6	7%	7%	44.8	118.7	165%
Financial services	105.2	725.7	4%	5%	84.4	150.4	78%
Life insurance	28.3	92.2	1%	1%	33.1	118.7	258%
Net household insurance	1.7	11.0	0%	0%	22.2	117.5	430%
Income loss insurance	2.1	3.7	0%	0%	189.0	111.4	-41%
Workers’ compensation	5.7	37.9	0%	0%	34.1	94.1	176%
Other goods and services	173.3	924.5	7%	7%	40.7	114.1	181%
Foreign travel by US residents	27.9	184.8	1%	1%	39.5	97.2	146%
Expenditures in the United States by nonresidents	-23.3	-201.5	-1%	-1%	44.4	109.5	146%
Net expenditures abroad by US residents	3.2	11.5	0%	0%			
Subtotal (with rough price change)	1,276.4	6,166.0	48%	44%			85%
<b>Total (with Rough Price Change)</b>	<b>2,665.0</b>	<b>13,953.7</b>	<b>100%</b>	<b>100%</b>			<b>145%</b>
Household consumption expenditures	2,664.9	13,953.8			52.1	109.5	110%
Personal consumption expenditures	2,712.8	14,392.7			53.0	109.9	107%
<b>Change in Purchasing Power</b>							
Weekly earnings, full-time workers 16 and older	344	917					167%
Cost-adjusted earnings (using rough price change)							9%
Cost-adjusted earnings (using household consumption expenditures)							27%
Cost-adjusted earnings (using personal consumption expenditures)							29%
Posttax weekly earnings, full-time workers 16 and older	295	943					219%
Cost-adjusted earnings (using personal consumption expenditures)							54%

Note: The most recent data available are for 2021, but we use 2019 to avoid issues to do with recent inflation.  
Source: BEA (2022b). Expenditures are from Table 2.5.5, and prices are from Table 2.5.4.

If we weight the increase in prices of the categories Cass includes and the categories he excludes by their relative share of 2019 spending, the overall price increase was 145 percent.<sup>4</sup> Dividing the increase in nominal earnings of full-time workers by the increase in prices indicates that purchasing power rose by 9 percent from 1985 to 2019.

Weighting the component price indexes in the way we have done here does not exactly convey the true change in the cost of living, because the relative importance of these categories shifts over time. (In the discussion above, we have weighted by their relative importance as of 2019.) Simply comparing the increase in earnings to the increase in the price index for household consumption expenditures indicates that purchasing power rose by 27 percent from 1985 to 2019. Comparing to the increase in the price index for overall PCE (which includes spending on households by nonprofit institutions) indicates a rise of 29 percent. Finally, using after-tax earnings and comparing to the increase in the PCE price index, the rise in purchasing power was 54 percent.

In short, Cass has chosen to focus on a bare majority of spending in the economy, even though the prices of these goods and services increased faster than did those for the items he excluded.

## Conclusion

Census Bureau statistics show median personal income higher in 2021 than in 1985 by 17 percent among men and 78 percent among women. Among those age 25–34, the increases were 6 percent and 56 percent (US Census Bureau 2022d). The Census Bureau figures indicate that workers' median earnings rose by 19 and 75 percent (13 and 53 percent among full-time workers) (US Census Bureau 2022e). These estimates understate gains in living standards because they rely on an inflation adjustment that overstates the rise in the cost of living (Winship 2016, 42–45). Nonetheless, none show anything other than gains over time in living standards.

Against these data, Cass asks us to believe that, in truth, living standards are down by 36 percent. We have shown that this claim bears no relationship to reality.

Cass's alternative methodology simply ignores the methodological challenges to measuring changes in purchasing power. He misunderstands professional economists' century-long project to address the circumstances consumers face as they attempt to optimize their well-being with the income on hand.

One way families have optimized their well-being over time has been by increasing income via greater work and higher wages among wives. That additional consumer demand has contributed to cost increases for goods and services. But it has not been driven by declines in husbands' earnings, since men's earnings have risen. Those (too-low) Census Bureau figures show that the median income of married-parent families rose by 52 percent (US Census Bureau 2022b). Among families with a sole breadwinner, the increase in median income was 21 percent (US Census Bureau 2022c). The increase in work among wives reflects demand for more (and more expensive) goods and services.

For that matter, affluence has likely contributed to the increase in single parenthood; the median income of single-mother families rose by 53 percent (US Census Bureau 2022b). Because of the decline in marriage, relying on multiple earners to get by has become a less common strategy since 1985 (US Census Bureau 2022c). The decline has also probably counteracted some of the inflationary pressures from more two-earner families.

While Cass's claims are out of line with all plausible estimates by serious researchers, they align neatly with his organization's view that American capitalism requires "rebuilding."<sup>5</sup> Policy researchers should start with the search for truth, ascertain it as best we can, and then craft policies that follow from the facts. COTI is policy-based evidence-making, and policymakers who want to help families would do well to reject it.

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4 Using the Bureau of Labor Statistics data on spending of consumer units with at least two people but only one earner and increases in the Consumer Price Index for All Urban Consumers (CPI-U), the increase in the cost of living was even lower: 123 percent.

5 See American Compass (2023). Consistent with this perspective, American Compass is funded, in part, through one foundation's "reimagining capitalism" initiative. See Omidyar Network (n.d.)



## About the Authors

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## About AEI's Center on Opportunity and Social Mobility

The Center on Opportunity and Social Mobility, directed by Scott Winship, conducts rigorous research and develops evidence-based policies aimed at expanding opportunity in America by reducing entrenched poverty, increasing upward mobility, and rebuilding social capital.

## About AEI's Perspectives on Opportunity

AEI's Perspectives on Opportunity is a policy report series published by the Center on Opportunity and Social Mobility (COSM). Contributions to this series include empirical and theoretical analysis of issues related to opportunity in the United States and evidence-based policy proposals to expand opportunity, promote upward mobility, and strengthen social capital. COSM Deputy Director Kevin Corinth is the editor of Perspectives on Opportunity.

# Appendix A. Methodological Details for COTI Reanalysis

In this appendix, we discuss the measures of earnings and costs Oren Cass used in his Cost-of-Thriving Index (COTI) analyses, critique them, and describe the improvements we made to them.

## Earnings

The basis of COTI is a simple comparison of annual costs to weekly earnings. For each of his categories, Cass divides the annual cost for a given year by the median weekly earnings of male wage and salary workers who are at least 25 years old and work full-time. The earnings estimates come from the Current Population Survey, with tables available from the Bureau of Labor Statistics website (BLS 2015). Median earnings for this group rose by 175 percent from 1985 to 2022, from \$443 to \$1,219. (Like all of Cass’s estimates, amounts are in nominal dollars—that is, not adjusted for inflation—because of his distrust of conventional inflation adjustment, arising out of confusion about its nature.) “Full-time” means that a worker usually works at least 35 hours in a week (BLS 2023a).

We use the same figures as Cass in our initial analyses (shown in Table 1). In Table 2, we expand the universe to include full-time female workers and full-time workers age 16–24. These are taken from the same Bureau of Labor Statistics tables.

## Food

First is a new addition since the original COTI: food costs. Cass takes the average of two food budgets estimated by the US Department of Agriculture (USDA)—a “low-cost” and a “moderate-cost” budget—for June of each year.<sup>6</sup> These food budgets are for a couple with both members between age 20 and 50 with two children, one between age 6 and 8 and the other between age 9 and 11. He estimates needs of \$4,550 in 1985

and \$13,667 in 2022. That translates into an extra week of work over this period for a man with median earnings today.

Our “improved” estimates make two relatively minor changes. First, Cass’s 1985 estimate uses stray figures for 1983 and 1986 from articles in the *Los Angeles Times* and several assumptions to interpolate a 1985 figure. Our improved estimate uses the actual 1985 figures published by the USDA (1985, 25). The resulting estimate of \$4,603 is close to Cass’s.

Second, rather than using the cost for one child age 6–8 and one age 9–11, we average the costs for two children over 18 years of childhood, as the USDA costs differ by child age. All children who survive will pass through 18 years of childhood, and it makes little sense to consider their food needs during only three of these years. This change has minimal effect on the trend but reduces the cost in both years by about 3.5–4 percent. Our two changes lower the increase in COTI over time by about one-fifth of a week.

It is notable that the USDA food budgets Cass uses are updated over time *using the sort of conventional inflation adjustment that Cass rejects*. The USDA budget for 1985 is based on a survey of households conducted in 1977 and 1978. Needs were defined anew beginning in 2003 using a survey conducted in 1989–91 and again beginning in 2008 using a survey conducted in 2001–02. Within these eras—for instance, between 2008 and 2022—the food budgets differ only in that they are updated for inflation using the appropriate Consumer Price Index (CPI) for different food items.<sup>7</sup> Furthermore, when new eras were begun—for instance, in 2008—the inflation-adjusted cost of the newly introduced food budgets were also held constant relative to the previous year’s budgets (Carlson, Lino, and Fungwe 2007).

Given that Cass’s approach depends on conventional price adjustment, and because the CPI methodology otherwise is clearly superior to Cass’s,<sup>8</sup> our preferred

<sup>6</sup> For 2022 figures, see USDA (2022).

<sup>7</sup> See the notes to the various reports included at USDA (2023).

<sup>8</sup> There are several differences between what American Compass has done and how food prices generally are measured using the CPI. First, the US Department of Agriculture (USDA) food “needs” were updated only twice over this 37-year period, while the relative weights of the items in the CPI food bundle were updated 13 times to reflect changes in what people buy. Second, the creation of USDA food bundles is based on a technocratic assessment of what constitutes a low- or moderate-cost food budget based on a subjective determination of

results use our “improved” 2022 estimate and then deflate it for inflation to obtain a 1985 estimate. The 1985 estimate is the cost of obtaining, in 1985, groceries that provided the same satisfaction as the 2022 food budget provided. Rather than use the CPI, we use the 1985-to-2022 change in the Personal Consumption Expenditure (PCE) price index for food and nonalcoholic beverages purchased for off-premises consumption. That index improves on the CPI by accounting for consumer substitution.<sup>9</sup> Our preferred cost estimates rise by 149 percent rather than 200 percent, increasing the 1985 COTI by nearly two weeks and reducing the 2022 COTI by a bit.<sup>10</sup> Instead of food becoming “more expensive” by an extra week of work from 1985 to 2022, our preferred estimates show it becoming cheaper by a week’s work.

## Transportation

The next item in the COTI basket is the average cost of owning and operating a new automobile driven 15,000 miles per year. Cass takes this from the federal Bureau of Transportation Statistics, which uses estimates from the American Automobile Association (AAA) (BTS 2022). The cost includes variable expenses such as fuel, oil, maintenance, and tires and fixed expenses such as insurance, license and registration fees, taxes, financing a car loan, and depreciation.

Cass estimates that transportation costs rose from \$3,484 to \$10,729 (208 percent) from 1985 to 2022. That is equivalent to about an additional week’s work for the median male employee.

Cass’s transportation cost estimates have several significant issues. The first is that it is unclear that his 1985 estimate is comparable to his 2022 one. The AAA estimates were based on three cars in 1985, all four-door Chevrolets (AAA 1985). The 2022 estimates are based on five cars in each of nine vehicle categories (AAA 2022a; AAA 2022b). Further, the individual costs are estimated inconsistently over time. For instance, in 1985,

depreciation (the annual decline in the value of the car) is based on trade-in value after four years, or at 60,000 miles. In 2022, it is based on trade-in value after five years, or at 75,000 miles. As another example, financing costs in 1985 assume a 20 percent down payment and a four-year loan, while in 2022, they assume a 10 percent down payment and a five-year loan. All else equal, we’d expect financing costs higher in 2022 than in 1985 because of this methodological change.

A second issue is that the net cost of owning a car (compared with not owning a car) is less than the gross cost. The net cost subtracts from the costs included in the AAA estimates the transportation services you get from putting your wealth into a car rather than, say, a checking account. Because this way of thinking about costs is not intuitive, we elaborate in Appendix B.

To see the basic point, however, imagine that cars do not lose their value (and ignore other fixed and variable costs). In that case, you could sell a car for the same price you paid when you bought it. “Buying” a car would no more entail a cost than “buying” a checking account, plus you would get to drive around while you owned the car (while people with a checking account would have to rent cars, use Uber or Lyft, or find other solutions).

With this insight, it is clear that the extent to which net transportation costs increase over time depends on the extent to which the gross costs increase relative to the increase in the value of the transportation services one gets from car ownership. The AAA estimates make no attempt to account for these services, so Cass’s estimates overstate the cost of car ownership and operation.

We estimate our “improved” transportation costs by crudely (but conservatively) adjusting the AAA estimates to account for the transportation services provided by car ownership. In our housing analyses, below, we estimate that in 1985, the net housing costs of homeowners with a mortgage (after accounting for the services provided by homes) were 61 percent less than gross costs. (In 2022, we estimate they were 91 percent lower.) Those gross

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food “needs” by age and sex, and American Compass arbitrarily averages the costs of those budgets, while the CPI food bundle is based on what the average family actually buys. Third, the CPI food bundle is updated separately for dozens of geographic areas, while the USDA food bundle is not. Fourth, the bundle American Compass uses is for a family with a specific composition rather than for all families.

9 As discussed below, substitution refers to the ability to switch between specific goods and services when their relative prices change. If apples become more expensive, consumers can switch to pears. They will be worse off than before, but not as worse off as implied by the CPI (which assumes they must simply keep buying the more expensive apples).

10 Using the CPI for food at home, the increase was 177 percent, about midway between the Cass estimates and ours. The CPI does not account for consumer substitution, however, which overstates inflation.

housing costs do not include depreciation. Reducing the estimated AAA non-depreciation costs by 61 percent in both years to account for the transportation services provided by a car seems warranted.<sup>11</sup> In fact, our approach probably overstates net costs in both years and overstates the increase in net costs. Indeed, it may obscure that car ownership actually works out to an increase in income for some families.

Our improved estimates indicate that the net cost of owning and operating a car rose from \$2,119 to \$6,383—a slightly smaller rise of 201 percent (versus Cass’s 208) but lower cost levels in each year than Cass estimates. Instead of increasing COTI by one week, as in Cass’s estimates, rising transportation costs increase COTI by half a week.

Importantly, there is no quality adjustment to speak of in the underlying AAA cost data Cass uses, except insofar as better quality reduces maintenance costs or depreciation. If, for instance, safety improves over time, there is no adjustment to account for the fact that part of the cost increase the AAA data show reflects better cars rather than increased prices for the same cars. The same is true if cars became more comfortable over time or had better entertainment options.<sup>12</sup>

This distinction points to a problem plaguing all of Cass’s nonfood estimates: Cass is looking at changes in spending, not changes in costs. Whereas the food budgets are defined with respect to a “need” standard that is presumed not to change over time (other than the price of affording it), Cass’s other “costs” simply look at what typical households spend. Changes in what they spend may reflect a decline in how affordable some need is (its cost), but it may just reflect that richer men are spending more on better goods and services than could be had in the past. If the latter were driving Cass’s

trends, then some family in 2022 might not be able to afford what the average family spends but still be able to afford better goods and services than it would have in the past. In that case, costs would not have risen; they might even have fallen.

Our “preferred” estimates account for this problem. They also incorporate consumer substitution in response to relative price changes and address the potential inconsistencies between the 1985 and 2022 estimates discussed above. We start with the “improved” estimate for 2022. For 1985, we deflate the 2022 figure using the PCE price index for transportation (covering the purchase of motor vehicles, motor vehicle operations, and other motor vehicle services).<sup>13</sup> The increase over time is just 133 percent, and the number of weeks of work required to meet transportation needs falls by one week instead of rising by one week, as in Cass’s estimates.

## Housing

The third item in the COTI basket is housing. Cass’s need standard is the cost of rent for a three-bedroom apartment at the 40th percentile of rents in Raleigh, North Carolina (the 45th percentile in 1985).<sup>14</sup> These estimates are produced by the Department of Housing and Urban Development every year at the county or metropolitan area level (PD&R n.d.).

According to Cass’s figures, housing costs rose from \$5,560 to \$18,204 (227 percent) from 1985 to 2022. That increase translates into nearly 2.5 additional weeks of work for the median male employee.

The big problem with what Cass has done here is that the costs renters pay are different from the net costs homeowners pay. This is important because three in four married couples own their home (as do half of single

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11 Reducing non-depreciation costs by 61 percent works out to valuing transportation services at about \$1,365 in 1985 and \$4,346 in 2022. For comparison, renting an economy car in 1985 for 30 weeks would have cost about \$3,000 (Borcover 1985), while renting a small car in 2022 for the same amount of time would have cost about \$9,000. For the 2022 data, we searched on Kayak.com rates in Raleigh, North Carolina, for the week of March 26 for Alamo to mimic the *Chicago Tribute* weekly quote for Alamo in Borcover (1985). These amounts are larger than the value of transportation services we estimate, but they are for relatively new cars, while transportation services become less valuable as cars age. (Further, choosing 30 weeks of rental is arbitrary.) The reassuring point is that our estimates for both years are each about half these real-world estimates, suggesting that our approximation is equally valid in both years.

12 Of note, cars seem to last longer than in the past (or at least Americans are driving them longer). See BTS (2023).

13 “Other motor vehicle services” include car rental and leasing, parking, and tolls. The PCE price index for transportation is based on the CPI, which treats the price of a new car as the purchase price. It also incorporates price changes for used cars.

14 Technically, the 2022 geography is for metropolitan Raleigh, while the 1985 geography includes the same three counties that make up the 2022 metropolitan area, though the Raleigh–Durham–Chapel Hill metropolitan area in 1985 included four counties, only two of which are in the 2022 Raleigh metro area. The three 1985 counties’ rents are weighted equally without regard to their population.

parents) (Federal Reserve 2019). Two-thirds of families with a single earner (including single-parent families) own their home, and over half of households without any college-educated members do (BLS 2021c; BLS 2021e).

When housing prices go up, renters and aspiring homeowners trying to save for a down payment on a mortgage unambiguously face higher costs. The situation is more complicated for people who already own their home. They may face higher interest rates on their mortgages and higher insurance costs and property taxes. But homeowners also see an increase in home equity. Just as depreciation is a cost, when an asset appreciates in value, that is effectively an increase in income. Homeowners also benefit from a rise in the value of service flows generated from not having to rent.

We elaborate in Appendix B. For the intuition, consider, first, home value appreciation. For simplicity, ignore any costs associated with homeownership (which we discuss below). For someone who purchases a home outright, say, for \$400,000, if they can sell the home one year later for \$410,000, they will end the year better off by \$10,000. (We also ignore inflation for purposes of illustration.) That \$10,000 is income to them in the same way that receiving a \$10,000 gift would be income.

It is only slightly more complicated if someone takes out a mortgage. Imagine for simplicity that the mortgage requires no interest payments. For someone buying a \$400,000 home by putting down \$80,000 and taking out a \$320,000 mortgage, as they make mortgage payments throughout the year, they increase their home equity correspondingly. After one year, if they sell for \$410,000, they can pay off their remaining mortgage balance and will still be better off by \$10,000. (In the real world, where mortgages are not interest-free, interest payments are a gross cost that partly offsets this income.)

Next, consider service flows. Just as a car provides transportation services that constitute income, so, too,

does a home provide shelter and other services that should be considered income. It is easiest to see this if we again ignore costs (and appreciation). Putting \$40,000 into a down payment (with a no-interest mortgage) and selling for the same purchase price after a year would leave someone with the same \$40,000 with which they began, but they will have had a roof over their head all year for free. Putting \$40,000 into a checking account would require renting an apartment and having less than \$40,000 at the end of the year. The net cost of homeownership values the services provided by owner-occupied housing against gross costs. Again, we encourage the skeptical to read Appendix B.

The costs of renters may not even be a good proxy for the *gross* costs of homeowners. Those costs involve mortgage interest payments (which depend on housing prices and interest rates), closing costs, property taxes, homeowner's insurance, maintenance and repair, and any depreciation. (After all, housing prices don't always rise, and even rising values can obscure deterioration in the quality of one's home.) Spending on shelter for homeowners with a mortgage constituted 19 percent of their total expenditures in 2021, compared with 27 percent for renters (BLS 2021d).

Our "improved" costs start with Cass's estimates but adjust them roughly (but conservatively) to reflect the net costs of homeowners. Using figures from the Bureau of Labor Statistics (BLS) Consumer Expenditure Survey, we estimate the average household's annual expenditure on shelter in both 1985 and 2021 by using the averages for renters and homeowners with a mortgage, weighted by their relative shares of households.<sup>15</sup> For homeowners, the value of shelter services is deducted from gross expenditure. (We ignore homeowners without a mortgage, because these will tend to be older and wealthier households outside the family formation concerns Cass poses. Including them with

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15 The average expenditure for renters is the mean of "rented dwellings." For homeowners with a mortgage, we first sum average spending on "mortgage interest and charges," average spending on property taxes, and average spending on "maintenance, repairs, insurance, and other expenses." This reflects gross costs, from which we deduct the value of shelter services. The deduction in 1985 is simply the mean rented dwelling expenditures of renters. The most recent expenditure estimates available are for 2021. The increase in mean rental expenditures from 1985 to 2021 was 331 percent (which could reflect improved rental unit quality or size rather than price increases), while the PCE price index for rent (confined to renters) increased just 215 percent. Therefore, to be conservative in estimating the value of shelter services in 2021, rather than use the 2021 mean rent of renters for the value of shelter services to owners, we inflate the 1985 rented dwelling expenditures by 215 percent and deduct that from the 2021 gross costs of homeowners with a mortgage. The assumptions are that the average value of shelter services to renters is the same as the average real expenditures on rent in 1985 and that the average value of shelter services to homeowners is the same as for renters. The second assumption would be violated if homeowners would actually have nicer (or less nice) apartments than their home if they were renting. Both the average expenditures and the relative shares of renters, owners with a mortgage, and owners without a mortgage come from BLS (n.d.) for 1985 data and BLS (2021a) for 2021 data. Other years are available from BLS (2023d).

other homeowners in this calculation would lower our improved cost estimates further.)

For both 1985 and 2021, we divide these composite estimates of average shelter expenditure that include renters and owners by the average expenditure for renters. This gives us an adjustment factor for each year that we apply to Cass's figures. (We assume the 2022 adjustment factor would be the same as the 2021 factor.) When accounting for costs separately for homeowners and renters, we find that overall housing costs were 19 percent lower than for renters alone in 1985 and 33 percent lower than for renters alone in 2022. The difference is partly due to a drop in mortgage rates over the period, which reduced the cost of homeownership. (One way falling mortgage rates affect affordability is by reducing the required down payment when a home is purchased.)<sup>16</sup> It also reflects rising housing prices, which made shelter services among homeowners more valuable even as they burdened renters.<sup>17</sup>

The resulting cost estimates rise from \$4,525 to \$12,234—an increase of 170 percent instead of Cass's 227 percent. Our estimates increase less than Cass's not only because housing costs for homeowners fell relative to those of renters but because homeownership rose a bit too—from 62 percent to 65 percent, according to the BLS data.

These estimates overstate costs and the increase in costs because they are not reduced by appreciation of home values for homeowners. For example, we estimate that the median homeowner in 1985 saw a capital gain that was at least one-third as large as the net cost for homeowners with a mortgage that we estimate above. In 2022, the capital gain far exceeded the net cost we

estimate. In other words, homeownership often cost little in 1985 and typically had a substantial negative cost in 2022.<sup>18</sup>

We also use the improved estimates as our preferred estimates. Ideally, we would use estimates that adjust for quality improvements; the home represented by the 40th or 45th percentile in terms of cost has improved substantially in many ways over time. That is true of both rented and owned homes. Cass's "cost" trend—as was the case for transportation—is really a "spending" trend. The home at the 35th percentile in 2022 may be nicer than the home at the 45th percentile was in 1985, and it might be just as affordable.

But existing price indexes measure home price changes in conceptually specific ways that depart from the ideal measurement of affordability. In the national accounts, for instance, the main housing prices estimated are those for the consumption of housing services by renters and owners. For homeowners, the "expenditures" to which these prices apply are netted out on the income side of the national accounts by the service flows provided by owned homes. So the cost of housing services net of this income is not reflected well by the "price" of housing services homeowners consume.

Income from capital gains (appreciation) is ignored entirely in the national accounts because these accounts are concerned with income from production, not from the increased value of assets per se. But the income from service flows and capital gains reduces the net costs of housing, so Cass's approach to assessing changes in affordability should account for them.

The basic issue is that the "price" of homes is better conceived as the "cost" of homes when looking

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16 Nominal 30-year fixed mortgage rates fell from 12.42 percent in 1985 to 5.33 percent in 2022 (FRED 2023a). Down payments as a share of the value of newly purchased homes fell from around 20 percent in the early 1990s to about 14 percent in the 2010s (Larson et al. 2022). See Figure C.3 in the source cited. Estimates are available at FHFA (2022). We are grateful to Ed Pinto for pointing us to the down payment estimates.

17 Nominal home prices rose 434 percent from 1985 to 2022, while real home prices (using the overall PCE deflator to adjust for inflation) rose 131 percent. For nominal prices, see Shiller (n.d.) and FRED (2023g). We use 12-month average index values pegged to January 2000. For the PCE deflator, see FRED (2023d).

18 According to the Survey of Consumer Finances, the median value of primary residences among owners was \$70,000 in 1989 (the earliest year available). Real home prices fell by 1.2 percent from 1989 to 1990, implying a capital loss in 1990 of about \$850. If the median sales prices of homes sold is used instead, we can get capital gain estimates for both 1985 and 1990, and the estimates are \$1,500 and -\$1,500. The median value of primary residences among owners was \$225,000 in 2019, and real home prices rose by 5.5 percent from 2019 to 2020. The implied capital gain is \$12,300. Using median sales prices of homes sold, the gains in 2020 and 2022 were \$17,500 and \$27,000. For Survey of Consumer Finances data, see Federal Reserve (2019). The estimates are in Table 9 (specifically, "Table 9 89 %s & medians" and "Table 9 19 %s & medians") of Federal Reserve (2019a). Home price data are from CoreLogic, available at FRED (2023b). We divide the price increase by the PCE deflator (FRED 2023d). Sales prices of homes come from the US Census Bureau and US Department of Housing and Urban Development, available at FRED (2023c). Our estimation approach is inspired by Larrimore et al. (2021).

at renters; when looking at homeowners, the price of homes is best conceived as their “value.” Changes in prices for homeowners cannot be translated as changes in costs.

While Cass’s estimates suggest that the number of weeks necessary for the median male earner to afford housing costs rose by two to 2.5 weeks between 1985 and 2022, our estimates indicate that the necessary work was essentially unchanged. And again, accounting for capital gains of homeowners would reduce the cost of thriving by more and probably lead to the conclusion that it takes fewer weeks of work to afford housing today than it did in the past.

## Health Care

For health care costs, Cass uses the premium paid by employees for family coverage in an average employer-sponsored health insurance plan from the Kaiser Family Foundation (KFF 2022a). While not mentioned in Cass’s paper, the Kaiser data go back to only 1999. To go back to 1987, Cass uses National Health Expenditures Accounts (NHEA) data from the Centers for Medicare & Medicaid Services on annual growth in employer-sponsored insurance expenditures and the share of premiums paid by private-sector employers (CMS 2022). He extrapolates further from these imputed values to go back to 1985. While Cass indicates that his estimates apply to “large” employers, the Kaiser estimates he uses include nonfederal employers with as few as three employees.<sup>19</sup> Nor are the NHEA data confined to large employers.

The biggest error Cass makes on this component is that he includes the cost of both the employee *and* employer contributions of health insurance premiums. Including the employer’s contribution doesn’t make any sense because the employee doesn’t pay this amount out of their wages. There is likely some *reduction* in income due to the health insurance premiums paid

by the employer. Indeed, the employee could be seeing a dollar-for-dollar reduction in wages (though it is tax-free income). However, that dollar-for-dollar reduction is *already showing up in the wage that employees are paid*. Cass’s approach is essentially subtracting the employer’s contribution twice. Counting the employer’s contribution as a “cost” to the employee makes sense only if one first adds it to the employee’s pay, which Cass does not do.

Take the 2022 data as an example. The baseline COTI calculation includes \$22,463 for health insurance, which is subtracted from the family’s income of \$63,388. However, Cass’s source data show that employees paid only 29 percent of the premium, or \$6,514. In terms of the COTI “weeks of work” calculation, correcting these data reduces the number of weeks from 18.4 to 5.3. This 13-week reduction is over half the total decline between 1985 and 2022. (The full decline is 22.4 weeks.)

Getting the health care number wrong is a big deal in the COTI calculation. The health care component is the single largest of the five components. It also comprises the cost with the single largest proportional increase from 1985 to 2022, over 10 times as large. (The next biggest is education, at a sixfold increase, with the rest around threefold.) And Cass has vastly overstated this cost and the relative increase.

Our “improved” estimates depart from Cass’s in two ways. First, we include only the employee contribution to employer-sponsored health care premiums. Cass’s source data include estimates of this employee contribution, but he uses NHEA data on the average share of premium paid by employees, applying this share to his overall premium costs from the Kaiser data, mixing numbers that are potentially incompatible. We instead use average employee premiums for family coverage from the US Labor Department’s Employee Benefits Survey and National Compensation Survey, available for workers at private employers with 100 or more employees from 1985 to 2022.<sup>20</sup>

19 His estimates are from Figure 1.12, while the estimates for large employers are in Figure 1.13 (KFF 2022a).

20 See BLS (n.d.), specifically series EBUFAMAVE00000ML, EBUFAMAVEW2000AP, and NBU21500000000000530216. Note that the figures are averages for employers that require an employee contribution. To obtain averages that account for employees that did not have to contribute anything, we multiply the figures by the share of employees for which contributions were required. See BLS (n.d.), specifically series EBUFAMCONTRIB0ML, EBUFAMCONTW200AP, and NBU21500000000000520214. There are two discontinuities in the combined series. Most service industries were excluded until 1988, and the minimum establishment size was 50 for some occupations and 250 for a few industries (rather than 100 after 1988). Part-time workers were excluded until 1991. For details on changes in the scope of the firms covered, see DOL (1994). It does not appear that these discontinuities create important breaks in the series. Note that the Kaiser survey data include the average employee contribution for family coverage back to 1999, though Cass does not use them (KFF 2022b). Another Kaiser report

Second, Cass's estimates do not include any health care costs other than insurance premiums. But even families with insurance may encounter two other types of costs. They may have to pay deductibles, co-payments, or coinsurance as part of their coverage, and they may have other out-of-pocket expenses for health care not covered at all by insurance. Cass's spreadsheet does include estimates of the former, taken from Kaiser from 2003 to 2018 and otherwise extrapolated (though he does not use them in COTI).<sup>21</sup> But Cass does not account for out-of-pocket costs that stem from limitations in what insurance covers. Nonemergency vision and dental benefits, for instance, are often covered only in their own insurance plans rather than the health insurance plans tracked by the Labor Department or Kaiser.

To incorporate these additional health costs, we turn to the Labor Department's Consumer Expenditure Survey, which provides average household expenditures in 1985 and 2021 for health insurance and for three other health care categories (medical services, medical supplies, and drugs).<sup>22</sup> For 2022, we assume the share of health insurance expenditures to total health care expenditures is the same as in 2021.

Our improved estimates increase from \$920 in 1985 to \$9,684 in 2022. The 953 percent increase is close to Cass's 944 percent, but the levels are less than half as large as his in both years. As a result, the number of weeks of work required to afford this cost rose from just two to eight weeks, while Cass's rose from five to over 18.

As is the case with housing, Cass's health care estimates (and our improved ones) are not so much cost estimates as they are spending estimates. The typical health insurance plan today covers more services than was the case in 1985, and the services it covers have improved over time. Some of the increase in "cost" is really just an increase in spending that reflects the

consumption of more and better health care services than what was typically consumed in 1985. To account for this quality improvement, our "preferred" estimates start with the improved estimate for 2022 and deflate it to adjust for the change in prices over time. We deflate the health insurance component by the PCE price index for health insurance and the noninsurance component by the PCE price index for health care services (FRED 2023e; FRED 2023f).

The resulting estimates increase from \$2,345 to \$9,684, or 313 percent. The amount of work required to afford this cost increases by just over 2.5 weeks. Health care is the first of Cass's costs that increases faster than men's median earnings. That said, it is widely believed that price indexes for health care overstate the increase in prices, with some researchers arguing that health care prices have actually declined over time (Cutler et al. 1998; Dauda, Dunn, and Hall 2019). Our preferred estimates are likely to overstate the increase in health care costs.

One final point worth noting is that the \$9,684 "typical" amount spent on health care in 2022 is an average, whereas the male wage measure against which this expense is being compared is a median. It is well-known that averages are affected by outliers, meaning that a small number of big spenders can pull the average up. This makes the mean a worse estimate of the "typical" spender than the median. Ideally we would want to compare median wages to median spending, or mean wages to mean spending. Comparing median wages to mean spending will overstate COTI.

## Education

For education costs, Cass uses the average cost of attending an in-state four-year public college, including tuition, fees, and room and board. These data come

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provides estimates back to 1988 (Levitt et al. 1999). We compared the magnitude of premium increases in the Labor Department data to the increases in the Kaiser data. From 1988 to 1993, the Labor Department data show a 112 percent increase, while the Kaiser data show a 138 percent increase.

21 See Rae, Copeland, and Cox (2019). These estimates are for workers in firms of at least 1,000 employees, also making them potentially incompatible with Cass's other estimates.

22 See BLS (n.d.). We compute the share of health care expenditures constituted by health insurance in both years to adjust our employee premium estimates. This share depends in part on how many households are covered by employer health insurance specifically (rather than being covered by government insurance for the poor, aged, or disabled or being uninsured), and it depends on how generous coverage is. We use the shares for households in which the head is a manager or professional. This group is unlikely to be covered by Medicaid or Medicare or to be uninsured. In addition, their health insurance coverage is likely to be more generous than for most workers, so the share of costs covered by insurance is likely to be higher than for most workers, making our adjustment conservative. (The shares, however, are similar for wage and salary workers generally, households with two or more people and a single earner, married couples with children, and all households.)



from the Department of Education’s National Center on Education Statistics (NCES) (NCES 2021b). This category is also important to his estimates, as the increase is almost sixfold between 1985 and 2022.

Not everyone attends college, and not all college-goers attend four-year colleges. In 2021, 62 percent of high school graduates immediately attended college, and just 43 percent attended four-year colleges. In 1985, these estimates were even lower (58 percent and 38 percent) (NCES 2022). Furthermore, not all students graduate from high school, and not all college students stay enrolled. Many families will never spend a dime on college education, and some will pay for less than four years. Cass himself has been an outspoken opponent of the “college-for-all” view that everyone should attend four-year colleges.<sup>23</sup> However, here we follow Cass in assuming that “thriving” involves sending one’s children to four-year colleges.

Cass divides the annual cost by two. He assumes that parents save for one semester of school for 16 years (eight years of saving for each child to cover eight semesters). The annual costs in the NCES must be doubled to account for two children, then multiplied by four years of school, then divided by 16 years of saving. Clearly, this is an arbitrary way to apportion the expense of two four-year degrees into annual costs. Dividing by 18 or 20 years of savings would lower the annual cost, while dividing by 10 or 12 years would raise the annual cost. Arguably, the expense should be divided by all the years adults subsequently live after becoming parents (or after deciding to become parents), since they will not incur any college savings expenses once their children are adults. (Alternatively, COTI could be reframed as a COTI

during years of parenthood.) Cass’s methodology also implicitly assumes that students themselves should pay nothing toward their college costs.

However, Cass’s most important problem is that the data he uses are not representative of the true cost that a family will pay for college because he uses the published, or “sticker,” prices of attending college. But college tuition and fees are discounted in various ways, both from federal and institutional aid. Furthermore, discounting has increased over time. For example, the College Board finds that for academic year 2022–23, the average *published* cost of a public four-year college was \$23,250 (including tuition, fees, and room and board). However, the average *net price*, what students actually paid, was over a third smaller: \$14,560 (Ma and Pender 2022, 18).

We improve Cass’s estimates in three ways. First, we use undergraduate data from the NCES’s National Post-secondary Student Aid Study (supplemented with College Board data) to estimate trends in the actual costs students at public four-year institutions incur.<sup>24</sup> Second, we use median costs rather than mean costs. Third, we spread the cost over 18 years rather than 16 years.

Our improved estimates increase by 401 percent, compared with Cass’s 480 percent. In terms of weeks of work, our estimates rise from four to about 7.5 weeks—smaller than the increase from four to nearly nine weeks that Cass reports.

We use the “improved” estimates as our “preferred” estimates as well. Conventional price indexes apply to tuition and fees, not to other college costs such as room and board, and an increasing share of the price is covered by grant aid. Education costs, like health care costs, have risen faster than male workers’ pay. Still,

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23 A Google search for “Oren Cass” and “college for all” shows how frequently Cass discusses this topic.

24 We obtained consistent estimates for 1992–93 through 2015–16 via the interface at NCES (n.d.). The estimates for these years are attendance-adjusted student budgets less grants, for dependent, full-year, full-time undergraduates at public four-year institutions. Student budgets include tuition and fees, books and supplies, room and board, transportation, and personal expenses, usually as given by school-produced budgets. (The attendance adjustment applies only to students not attending for the full year and full-time, so it is not relevant.) Grants include federal, state, institutional, and outside grants (including employer tuition reimbursement). We also obtained estimates for 1986–87 to 1992–93, using the same source, but estimated attendance-adjusted total costs less grants instead of student budgets. Total costs include tuition and fees, books and supplies, equipment, commuting, childcare required to attend classes, and either total household expenses or (for on-campus students) room and board. (All are mostly reported by students.) We assumed that student budgets less grants rose at the same rate from 1986–87 to 1992–93 as did total costs less grants. Finally, we assumed that from 1985–86 to 1986–87, student budgets less grants rose at the same annual rate as total costs rose between 1986–87 and 1989–90. Finally, we obtained estimates for 2015–16 and 2022–23 from Ma and Pender (2022, 18) and College Board (2022). The years 2022–23 are projected by the College Board. These estimates are average net cost of attendance for first-time, full-time, in-state undergraduates at public four-year institutions. Net cost of attendance includes tuition and fees, room and board, and “allowances for books and supplies, transportation and other personal expenses” published by schools, less grants (Ma and Pender 2022, 3, 11, 17). We confirmed that the annual growth rates between 2007–08 and 2011–12 and between 2011–12 and 2015–16 were similar to the annual growth rates in median student budgets less grants in the NCES data for the same periods. We then estimated the 2022–23 student budget less grants using the 2015–16 estimate increased by the annual growth rate in the College Board data.

higher education spending is an investment expected to yield returns. The typical return on investment, in present value terms, of a four-year degree has been estimated at nearly \$130,000, even after accounting for the risk of non-completion (Cooper 2021). Some of the difference between the growth of (parent) earnings and the growth of education costs reflects an increase in the return to getting a college diploma. The return to college (to the parents, in terms of the utility from their children’s greater earnings potential) should ideally be reflected in the (net) cost.

## Taxes

One cost of thriving that the index does not consider is taxation. Failing to include the net impact of taxes is a major omission, especially because of how much this component has changed between 1985 and 2022. In broad terms, families with children have seen large reductions in their federal income tax burden, largely due to the introduction and expansion of the child tax credit. The absence of taxes in COTI is notable since expanding tax credits to working families is a signature policy proposal from American Compass. To understand where policy should go in the future, we need a full accounting of current policy.

To include the burden of taxation, we calculated federal income and payroll taxes for the baseline COTI family. We assumed that earnings are the only taxable income this family has and that they are taking the standard deduction for a married couple filing jointly in both years. We subtracted the employee side of health insurance premiums from their earnings for purposes of the tax calculations, using our estimates as described above. We also assumed that the families had two children (since this is used explicitly in the COTI calculation for food and education costs and implicitly in the housing cost) and that both children qualify for the child tax credit in 2022.<sup>25</sup> We also include the employee-side cost of payroll taxes.<sup>26</sup> Scott Winship’s analyses of the Annual Social and Economic Supplement to the Current Population Survey suggest that median and mean state income

tax rates changed little over this period. Homeowners’ property taxes are included in our “improved” and “preferred” housing costs in Tables 1 and 2.

The family in 1985 will owe \$2,158 in federal income taxes, or about 9 percent of its market income. This amount is a substantial burden on this family, roughly equal in size to the health care and education components in Cass’s original COTI analysis. Ignoring it is a huge oversight. Here is a brief description of the calculation: \$22,727 of income to report (after tax-free health insurance premiums) and \$4,160 in personal exemptions, giving them \$18,567 in taxable income, resulting in the tax of \$2,158. (The standard deduction was built into the brackets in 1985.) The payroll tax amounts to another \$1,602 (7.05 percent of taxable earnings, a slightly lower rate than today).

In 2022, the tax situation of the family had changed dramatically. A family did not owe federal income tax but received a net tax credit of about \$646. Thus, the net effect of the federal income taxes on the cost of thriving in 2022 was to make it easier to thrive. We can debate whether the current policy is ideal, but these are the facts. Here is the calculation for 2022: The family has \$57,282 of income to report and takes the \$25,900 standard deduction, giving it \$31,382 of taxable income and a tax of \$3,354, which is then offset by the family’s \$4,000 child tax credit. The payroll tax rate has risen modestly to 7.65 percent, which amounts to \$4,382.

To put this in terms of COTI, in 1985, the family needed 8.5 weeks of work to pay its federal tax burden. By 2022, this was down to three weeks.

We mainly focus on results treating taxes as a cost against which earnings are compared. However, we also report results that compare Cass’s original costs against posttax earnings.

25 When we expand the sample to younger full-time workers and female full-time workers, the median is low enough that the representative family would qualify for the earned income tax credit (EITC) in 2022 as well (and in 2019, when we compare 1985 to 2019 later). We reduce tax liability by the EITC amount.

26 Federal income taxes may be estimated using the IRS Form 1040 and instructions, which are available at IRS (2022a; 2022b; 1985a; 1985b). Federal payroll tax rates are available at SSA (n.d.).

## Appendix B. The “Cost” of Owning and Using Cars and Homes

Conceptualizing the “cost” or “price” of car ownership and homeownership is surprisingly complicated. The key ideas are nonintuitive and poorly understood, even by most economists. This appendix provides the rationale for the critique we make in the report of Oren Cass’s treatment of these costs.

### Costs, Income, and Asset Transfers

Imagine you win a lottery and receive a check for \$20,000. If you then deposited this income in your own checking account at the bank, would you say that you had “spent” \$20,000? Would you say that you had incurred a “cost” of \$20,000? Of course not. You would understand that you have only stored your income. Similarly, after a year, if you withdrew the \$20,000 from the checking account as cash, would you consider this as another \$20,000 in income? None of us would: The \$20,000 would have been received as income a year earlier, and calling it income again a year later would be double counting.

Now, during that year, your checking account might have earned you a modest amount of interest. The increased value of your initial \$20,000 would constitute income to you received in that year. (Throughout this discussion, we are ignoring inflation, which would make \$20,000 worth somewhat less a year later than \$20,000 at the start of the year.) Another way of characterizing the income from the year is to say that it is the increase over and above what your lottery winnings would have been worth (\$20,000) if you had not put them in your checking account.

If you have to pay a monthly maintenance fee for the privilege of storing your money in the checking account, that fee is a cost to you. We can think of the difference between the interest income you receive and the maintenance fee as net income, which will be less than the gross amount of interest income received and perhaps even negative. That is to say, comparing what you would have had at the end of the year had you not deposited your \$20,000 check to what you were left with as a result of your interest earned and fees incurred, you might be worse off than if you’d just displayed your

lottery check in a frame on the wall. In that case, your net income would have fallen, or, equivalently, you would have incurred a net cost.

### Car Ownership, Asset Depreciation, and Service Flows

Now imagine that instead of initially putting your \$20,000 check in your checking account, you purchased a car. Would you say that you had “spent” \$20,000 or incurred a “cost” of \$20,000? Most of us probably *would*. But in truth, we should think of this no differently from putting \$20,000 in a checking account.

To see this, imagine that cars do not decline in value over time. One year after purchasing the car, you could sell it for \$20,000. Again, we would not want to think of this as another \$20,000 in income; it is the same \$20,000 you won in the lottery. It’s just that you temporarily stored it in an asset (this time a car rather than a checking account).

Cars, of course, do tend to lose value—even the moment you drive them off the car dealership lot. You are unlikely to sell a car one year later for the same amount you paid. So while a checking account would probably make your original \$20,000 more valuable at the end of a year, the typical decline in the value—or “depreciation”—of a car would leave you worse off. Depreciation is a cost. Equivalently, it is negative income in the same way that interest from a checking account is positive income.

It’s not just that people arbitrarily feel your car isn’t worth \$20,000 after a year; the service that it provides is less valuable to you as the owner, barring additional maintenance, which is an expense to you. Eventually, if you own the car long enough, it will stop working entirely. Your original \$20,000 will be worth next to nothing at that point, whether you try to sell the car or not.

In addition to the cost of depreciation, over the year subsequent to purchasing a car, you will have incurred expenses to register and insure the car, purchase gas, and maintain the vehicle. These are gross costs analogous to a checking account fee.

There is one more important gross cost to consider. If, instead of purchasing a \$20,000 car, you buy a \$30,000

car after taking out a loan for \$10,000, the interest on the repayment of the loan is another cost. The *principal* you pay is not a cost, because paying it simultaneously increases your wealth. If your car loan were interest free (and there were no depreciation), you could sell your car for \$30,000 and pay off the remainder of your loan, and then you would have your original \$20,000 plus whatever principal you had paid up to that point.

All these costs of owning and operating a car, however, do not simply constitute wasted money; you would have benefited from the flow of transportation services the car provided. Those are benefits you would have had to pay for if you had not purchased the car, such as by renting a car as needed or hiring Uber drivers. (After all, there is a reason you would invest in a car rather than some other asset.) A reduction in expenditures is equivalent to an increase in income. You would have consumed transportation services whether you had purchased the car, but by purchasing it, you get them for the lower costs delineated above. You may even consume more transportation services than you would have if you had had to rent or hire a car as needed.<sup>27</sup>

If it seems strange to define these transportation services as income, imagine again that cars did not depreciate at all (and ignore other costs). In that case, you could buy a car (put your \$20,000 into an asset), drive around for a year, and then sell the car, getting a \$20,000 check from the buyer. You will have a \$20,000 check at the end, just as at the beginning of the year, and you will have

“paid” nothing, but you would have driven around for a year. That’s different from spending \$20,000 on a blow-out party and having warm (or hazy) memories after (but no more \$20,000). And it’s different than drawing down your \$20,000 to pay for car rentals and Uber rides.<sup>28</sup>

Over the year, then, the cost of buying and driving a car isn’t the purchase price of the car itself (which just reflects the transfer of wealth to a physical asset). It is the cost versus not having purchased the car. That cost amounts to depreciation and the things you had to pay for during the year to drive the car (including loan interest payments), less the benefits you received from the transportation services the car provided. If those benefits exceed the costs, you might even incur a negative cost—or, equivalently, receive income.

It is true that one needs to have the savings available to purchase a car in the first place (or the ability to incur debt). But having sufficient wealth was a requirement to purchase a car in 1985 as well as in 2022. In any year, the ability to save and borrow depends on many factors. But two primary ones—interest rates and the purchase price of cars—do show up as costs of car ownership as we (and Cass) have defined it, through car loan interest payments and depreciation.

Cass’s measure of the “cost” of owning a car effectively ignores the gross income represented by the benefits from the transportation services a car provides, counting only the gross costs. Thus, his estimates overstate net costs, which means his COTI overstates

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27 The value of the service flow from a car is actually larger than this “net imputed rent.” It should include the foregone returns if, instead of buying (or holding onto) a car, someone had relied on car rentals and then invested in some other asset an amount equal to the difference between the car equity (net of the other ownership costs delineated above) and the rental spending. That is, the service flow from the car must be at least as valuable as (equity in the car – ownership costs – rental costs if you did not own a car + returns from investing what is left), else a rational person should sell the car (we ignore transaction costs), rely on rentals, and invest what’s left of the proceeds.

28 We can also illustrate the point by explicitly comparing the costs and benefits of car ownership to the counterfactual costs and benefits of not purchasing a car. Imagine a counterfactual in which someone spends \$10,000 renting a car for a year, enjoying \$10,000 worth of transportation services. For an initial car ownership scenario, imagine there are no operating costs, depreciation, or other costs. Imagine, too, that the person drives the car exactly as much as they would have if they had rented a car instead. In that case, if someone buys a car, they start with \$20,000, enjoy \$10,000 worth of transportation services for a year, and then sell the car for \$20,000. Whereas the renter paid \$10,000 to get \$10,000 worth of transportation services, the owner paid nothing for the same \$10,000 worth of services. We can calculate the net cost to the owner as (cost of owning – benefits of owning) – (cost of renting – benefits of renting), which is  $\$0 - \$10,000 - (\$10,000 - \$10,000) = -\$10,000$ , or \$10,000 in income. If the owner incurs \$9,000 in gross costs to drive the car for a year (some of it because the car depreciates and sells for less than \$20,000), then the calculation is  $\$9,000 - \$10,000 - (\$10,000 - \$10,000) = -\$1,000$ , or \$1,000 in income. (This calculation does not depend on the owner actually selling the car after one year. The loss in value is a cost regardless.) If the owner incurs \$9,000 in gross costs but drives the car 50 percent more than they would have if they’d had to rent it, the calculation is  $\$9,000 - 1.5 \times \$10,000 - (\$10,000 - \$10,000) = -\$6,000$ , or \$6,000 in income. Finally, if the owner incurs \$9,000 in gross costs and drives 50 percent more than if they’d rented, but the counterfactual is that they would have driven as a renter only enough to cost them \$3,000, the calculation is  $\$9,000 - 1.5 \times \$3,000 - (\$3,000 - \$3,000) = \$4,500$ . In that case, there is a positive cost to car ownership. But this example assumes the owner drives less than in the other examples (consuming \$4,500 worth of services rather than \$10,000 or \$15,000 worth). What matters is not how much someone would have driven as a renter but how much they actually drive as an owner, the market price for those transportation services, and the gross costs.

affordability problems in every year. Because he is using nominal rather than inflation-adjusted dollars, his COTI overstates affordability problems more in more recent years, which correspondingly overstates the increase in net costs over time.

## Homeownership, Asset Appreciation, and Service Flows

If cars tended to increase in value, then rather than incurring a “cost” of owning and operating a car, one might increase one’s income by purchasing a car. That is, setting aside other costs and benefits of car ownership, if you could sell a car purchased for \$20,000 for \$30,000 at the end of the year, then the increase in value would constitute net income.<sup>29</sup>

This possibility becomes more important when we look at the “cost” of buying a home. Once again, the key idea here is that the cost is not the purchase price. Using a \$20,000 lottery check to make a down payment is just transferring wealth to a physical asset, like buying a \$20,000 car.

As with buying a car, the cost of owning and using (living in) a home would be the net cost versus not owning it. It would include any loss in the home’s value over time, plus the things you have to pay (such as closing costs, maintenance, and insurance) to buy the home and live in it without loss of satisfaction. It would include the interest paid on your mortgage, but not the principal. The services provided by the home (primarily shelter) would count against these costs as income.<sup>30</sup>

A big difference between purchasing a home and buying a car is that homes tend to appreciate in value

over time rather than depreciate. Putting your \$20,000 in a down payment toward a home usually looks more like putting your \$20,000 in a checking account (or a financial instrument with better returns than a checking account) than using it to buy a car.<sup>31</sup>

Because owning a home is likely to generate income, it is especially important to get the “cost” of “housing” right for homeowners when assessing how affordable housing has become over time. For renters, the cost is relatively straightforward. Cass’s analyses rely, reasonably, on estimates of market rents paid by renters, although he restricts his scope to three-bedroom apartments in the Raleigh area.

However, Cass also uses estimates of market rents to look at changes in *homeowners’* housing costs. The federal government’s National Income and Product Accounts also use market rents to assess changes in homeowners’ expenses, but the treatment is more complicated and consistent with our approach.

National accounting requires that any income received be offset by expenditures made, and it seeks not to show a decline in national income or expenditures as homeownership rises. Consistent with the discussion above, it counts the benefits from the housing services provided by owning a home as income, after deducting the costs discussed above (including depreciation and mortgage interest). The national accounts offset this income on the spending side with an equivalent amount of consumption of housing services.

The income and expenditure are termed “imputed rent.” Intuitively, the national accounts seek to recognize the consumption of housing services on the spending side, even though no money trades hands when a

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29 That you would come out ahead if you sold the car means you have received net income during the year, *even if you don’t actually sell the car*. Imagine the value of the car somehow increases to \$30,000 in the first year you own it and then remains at that value for four more years. (Ignore costs and inflation for this exercise.) If you sell the car at the end of the five years for \$30,000, the \$10,000 in income you receive (called a “capital gain,” the amount over and above your original \$20,000) is properly considered as having been earned during that first year you owned it. At the end of that year, you could have sold the car and spent the \$10,000 on a vacation. That you chose to realize the \$10,000 gain only after four more years is irrelevant; your purchasing power increased in that first year. The same is true of depreciation; it is a cost incurred even if you don’t try to sell your car.

30 As with a car, the value of the service flow from a house includes the rent one would have to pay if one did not own the house and the returns if one invested in some other asset the difference between housing equity (net of other ownership costs) and counterfactual rental costs. Valuing the service flow this way makes the homeowner indifferent between owning and renting.

31 A homeowner might accrue capital gains (income from appreciation) in part because the service flow from homeownership has become more valuable over a year (because housing prices are rising). But capital gains can accrue above and beyond the increase in the value of service flows. (For instance, home prices may rise faster than rents.) Moreover, the value of service flows over a year is the sum of monthly service flows, rather than the increase in the value of the one-month service flow over a year’s time. If housing services are worth \$2,000 in January and increase by \$100 every month, the service flow (income) over the year is \$30,600, while the capital gain from the increased value of service flows will be just \$1,100 (11 × \$100). It is not double counting to count the \$1,100 as income (because the home is worth more as an asset) and the \$30,600 as income (because having to rent the home would have cost that much).

homeowner consumes these services.<sup>32</sup> The accounts also recognize that homeowners receive an income-like flow of benefits from these services, since they would have to pay for them if they were not homeowners. Fundamentally, however, this confusing convention of the national accounts reflects the decision to keep measured economic activity from shrinking when homeownership increases, as would happen if the accounts looked only at housing services consumption that involved money trading hands.

In the national accounts, imputed rental *income* is net of the gross costs associated with homeownership, while imputed rental *expenditures* are gross of them (Mayerhauser and Reinsdorf 2007; BEA 2022a). Therefore, the net cost of owning and living in a home, after subtracting net imputed rent “received” by the owner from imputed rent “paid” by the same owner, is the sum of these other homeownership costs. This treatment is consistent with our discussion above.

Cass’s treatment is inconsistent with this approach, as the cost he tracks for homeowners is the “cost” of the free housing services they consume (approximated by market rents paid by renters). Cass’s approach neglects that this “cost” is actually income to a homeowner. The gross costs involve mortgage interest payments, depreciation, maintenance, homeowners’ insurance, and property taxes. The net cost—which may be a negative cost (i.e., income)—subtracts these gross costs from the market value of housing services consumed and any appreciation in the value of the home. (More on that in a moment.) Rising house prices increase costs for homeowners only insofar as new homeowners face larger mortgage interest payments and existing and new homeowners alike face higher property taxes and insurance costs. Cass does not measure these, except insofar as landlords pass on these costs to tenants in the form of higher rent.

However it affects their gross costs, existing homeowners also experience rising housing prices as appreciation in the value of their home equity—which is also an increase in their income. The national accounts do not count this as income because they are concerned only with income from production (say, from newly constructed housing). National accounts

do not include income from pure capital gains that reflect only the changing price people are willing to pay for existing housing. But as the discussion above clarifies, asset appreciation is income from a homeowner’s perspective.<sup>33</sup>

To be clear, while the conceptual bases are straightforward for including as income the flow of services from cars and homes and the capital gains accruing from home appreciation, analysts (including the two of us) rarely do so. The reason for this is that it is much more difficult to estimate someone’s imputed rental income and accrued capital gains in household surveys than it is to estimate income from other sources. The result is that conventional analyses (such as ours in the latter part of the paper and those involving our “preferred” estimates earlier in the report) understate living standards and, when housing values are rising, improvement in living standards. (When housing prices fall, as they did during the Great Recession, conventional income figures can overstate living standards and their improvement.)<sup>34</sup>

But the impact in Cass’s analyses is much larger, given that the “costs” of housing and cars constitute such a large share of the limited costs he considers.

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32 The idea is to treat homeowners as landlords receiving rent from themselves as tenants.

33 For more on capital gains as income, see UNECE (2011).

34 For an example of research that incorporates capital gains into income, see Larrimore et al. (2021).

## Appendix C. Conventional Inflation Adjustment Versus the Cost-of-Thriving Index

In this appendix, we refute Oren Cass’s arguments against conventional inflation adjustment and provide a further critique of the Cost-of-Thriving Index (COTI) methodology.

Fundamentally, Cass and policymakers are interested in whether the cost of supporting a family has gone up. Cass has chosen an approach that is simple in concept: Determine a set of family needs at two different points in time (1985 and 2022), and then see whether the cost of those needs has risen. Of course, if incomes have also risen, then the increase in “cost” doesn’t tell you much, so Cass compares the change in cost to the change in income.

However, how does one determine what to include as needs at each point in time? It might be tempting to choose the exact same items in both years, see how much they cost in 1985 and 2022, and take that as the change in cost. There are three problems with this approach.

First, the things people bought in 1985 may have become less popular over time, so people switch to—or “substitute”—different, presumably better, things. That may mean it is impossible to calculate the cost of an item because it is so obsolete that it does not exist anymore in 2022. An example from entertainment goods would be the videocassette recorder. Alternatively, an item may simply no longer be widely considered a “need” in 2022. Powdered milk, encyclopedia sets, and tonsillectomies are not obsolete, but demand for them is much lower today than in 1985. In the meantime, new “needs” have arisen that should be included in the 2022 family budget but were not around in 1985. The cost of supporting a family in 2022 will then no longer reflect the right items (or their proper relative amounts). Avocados, cell phones, and chicken pox vaccinations would fall into this category.

The second problem is just a version of the first: Items can become nicer or better (higher “quality”) over time. If, holding quality constant, homes get cheaper over time, then people will substitute the newer, nicer homes for the older homes. The typical home in 2022 will be nicer than the typical home in 1985 was. And indeed, new homes today are nicer in many aspects. For example, in 1985, only 70 percent of new, single-family homes had air conditioning, but in 2021, that number had increased

to 96 percent. (This isn’t attributable just to the migration to hotter climates: Even in the Northeast, homes with air conditioning increased from 42 to 89 percent.) Median square footage increased from about 1,600 in 1985 to almost 2,300 in 2021 (US Census Bureau 2022a).

If “the typical home” is treated as an unchanging item, then the cost of the “item” might rise (or fail to fall) even though people are better off. A naive analyst might register an increased cost even though the cost of the original “need” has fallen (because the new cost affords something more than the original need). In reality, the cost of the original need (the typical home in 1985) will have fallen.

The third challenge is the arbitrary nature of identifying “needs.” Why would the cost of a typical home in 1985 represent “need”? Why not the cost of the typical home in 1900? Why not the cost of a home in 1985 that is, say, nicer than one-third of homes? What about the goods and services purchased by families that the analyst leaves off the list of needs?

Because of these challenges, economists tend to evaluate changes in the cost of living using conventional methods of inflation adjustment, as discussed in the report.

### Cass Confusion over Inflation Adjustment

Cass developed COTI because he believes that conventional inflation adjustment presents too rosy a view of changes in living standards and purchasing power over time. He believes that his framework is focused on the “affordability” of “needs,” while inflation measurement is not (Cass 2020, 12, 14). He lays out his objections in the 2020 paper that introduced COTI. But his critique is based on a number of misunderstandings about the methodology behind inflation adjustment and a lack of appreciation for the problems it attempts to solve.

A central confusion is that Cass does not understand the point of conventional inflation measurement. Cass claims “inflation measures the increased price of buying the exact same set of things as in the past” (Cass 2020, 6). That is simply not true. Inflation attempts to measure

the increased price of a *changing* set of things that provides the same utility over time. Because of this basic misunderstanding, Cass thinks that measures of inflation assume “that having the exact same set of things in 2018 as in 1979 would lead to the exact same level of well-being” (Cass 2020, 6). But they do no such thing. Inflation measures assume only that the set of things priced in the consumption basket in 2018 leads to the same well-being as the *different* set of things priced in the consumption basket in 1979.

As against what he thinks inflation measures track, Cass declares he wants a measure that “aims to hold constant absolute material consumption” by “track[ing] a more dynamic basket of the things that a family would need to retain the financial security and social engagement typical of a flourishing middle class” (Cass 2020, 6). He does not realize that that is what inflation measures try to do—holding constant absolute utility derived from material consumption by tracking a dynamic basket of things. The things in this basket are the things that federal surveys indicate average people spend their income on, weighted by the share of average spending accounted for by each thing.

At times, Cass seems to understand that the set of priced items in inflation measures changes. He worries that if a new product is introduced—such as the automobile in a world of horses and buggies—and most people abandon the old product, those who do not switch are worse off than inflation measures convey. The world changes around them, so the old product is less useful, and they are worse off. In a world of city streets and highways, a horse and buggy is not viable. Cass raises the possibility that horses and buggies might disappear from the market entirely, so that some people would be compelled to buy cars against their will. Cass presumably understands that we are not currently tracking the price of buggies in modern inflation measures and that new products do enter into measures over time. Therefore, it makes no sense to say that inflation measures try to track the price of an unchanging set of products.

Cass is also wrong to think that inflation adjustment ignores that products from earlier years might not provide the same utility today as they once did. He apparently believes that inflation adjustment assumes that the utility one gets from a good is the same regardless of when one consumes it. But the utility one gets from a good is not

presumed to be constant over time; it depends on the other products on offer.

Conventional inflation adjustment does account partly for the issue of discarded products. Changes in the utility one gets from some good are revealed in inflation measures through changes in the weights the good is assigned in the consumption basket as the prices of it and its rivals change over time. When norms change, as when people shifted from horses and buggies to automobiles, the weights on old goods in the consumption basket fall. To the extent that norms have changed, relatively few people are in the position of preferring the old good. The number of people left worse off will be smaller the more widespread the new product’s adoption is. If there is only a slight preference for the old product, the world will not adapt radically, and those who like the old product will not be radically affected. If there is a strong preference for the new product, the world will adapt more radically, but fewer people will stick with the old product (or be unable to find a seller) and be hurt.

Moreover, because changing norms mean that demand for the old good will fall, its price will fall too, which partly compensates for the utility-diminishing impracticalities or uncouthness of sticking with the old good. People who prefer the old product will at least have more cash to purchase other things.

If an old product disappears entirely, that will hurt those who would prefer it to the available alternatives. But Cass offers no reason to think that a large number of people are significantly harmed when we move, say, from a 1985 standard of health care to today’s. There may be people who would prefer the more limited and less effective treatments of the past, but how many of them are there, and how much worse off are they? Cass cannot say. Nor does he say why the market would fail to provide a product for which significant demand remains. Cass has given us no reason to think he has identified an especially large problem for cost-of-living assessment.

Cass thinks that conventional inflation measures don’t really track changes in the cost of living. He says his COTI answers the question, “Does [a changing] wage cover a middle-class family’s needs?” That, he says, is the right question, not “how much has the money supply affected price levels in the economy” (Cass 2020, 14).

In suggesting that inflation measures are just answers to this wrong question, Cass appeals to the authority



of Michael Bryan of the Federal Reserve Bank of Atlanta (Bryan 2014). But that is a misunderstanding of Bryan's point. Bryan argued that inflation, in the sense of change in the cost of living—change in the price of a constant level of utility—is affected only in part by the inflation the central bank hopes to control, which is related only to aggregate supply of and demand for money. The inflation the Federal Reserve Board influences certainly affects the cost of living, but the cost of living also varies across regions, groups, and ultimately individuals for reasons outside the supply of and demand for money. Bryan's speech is about what tweaks to the inflation measures on offer best produce estimates of the inflation the Fed can influence. He's not making the point Cass wants to make.

Cass's ignorance of what price indexes actually do comes through in his other arguments as well. He asserts that if "large and costly necessities become unaffordable while other components of the consumption basket plummet in price and become ubiquitous," then conventional inflation adjustment will miss a decline in the ability of people to afford a "contemporary standard of living" (Cass 2020, 13). Cass offers a stylized example, in which doctor visits become 20 times pricier, while televisions become cheaper by 99 percent. In his example, a family grows 25 percent richer and then switches from 10 doctor visits and an acceptable TV to one doctor visit and an amazing TV. "Is the family better off?" Cass asks (Cass 2020, 13).

He answers that if access to doctors is "more important to the household, life became less affordable" (Cass 2020, 13). Set aside the extreme numbers used in this example, in which there is simply no way for the family to keep affording 10 doctor visits by buying less of other things. Cass seems to suggest that conventional inflation adjustment would not reach his preferred conclusion, but that is untrue.

If the price of doctor visits goes up by a factor of 20 and the quantity of doctor visits goes down by 1/10th, or

2/20th, then the spending dedicated to doctor visits will rise by a factor of two. Meanwhile, spending on TVs will have fallen by a factor of 1/100th. In the new consumption basket priced by some inflation measure, the price of doctor visits will be weighted more heavily relative to the price of TVs *after* prices change than before, because spending on doctor visits will be higher and spending on TVs lower. So the cost of living will increase because doctor visits become a bigger share of consumer budgets, while their price rises dramatically. Conventional inflation measurement would find the family worse off.

Aside from his general misunderstanding of conventional inflation measurement, Cass devotes considerable effort to arguing that it specifically overstates the affordability of health care. It does so, he says, by failing to recognize that few people see a "tangible benefit" when health insurance premiums rise due to improvements in care that will benefit only a small number of people with rare conditions (Cass 2020, 13). However, to the extent this occurs, this is just the nature of group insurance; in any year, most people pay more than they end up receiving in benefits because there is a small chance they will end up needing a lot more care than they pay for. The primary benefit most people get from insurance is risk mitigation, not care.

Moreover, because health insurance (unlike, say, car insurance) in practice covers routine costs rather than low-probability risks, much of its increased cost (and value) comes from more generous coverage that does benefit most enrollees (such as annual checkups and prescription drugs). At any rate, Cass's attempt to show that "the typical household is paying almost \$13,000 more to get health care that costs \$2,200 more" is based on a deeply flawed analysis (Cass 2020).<sup>35</sup>

Finally, Cass also objects to conventional inflation measurement on the grounds that it focuses on the average household rather than on families. It is interesting to imagine a separate price index for only families, families

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35 Cass compares the trend in mean premiums for family coverage to an estimate of median health care expenses for a couple with two kids. The latter, however, is cobbled together by doubling the median expenses (conditional on having any) for a non-elderly adult, doubling the median expenses (conditional on having any) for a child, and adding them together. This approach suffers from several problems. The median expense for two-adult, two-children families isn't necessarily the sum of four medians for individuals, especially when the two adult medians include individuals not in families and all four medians include people with no health insurance. Even if the median expense for two-adult, two-children families was accurate, the mean premium estimates should really be compared to expenses for all families (with employer coverage), not just two-adult, two-children families. Furthermore, by using medians rather than means for the expense estimates, Cass is removing the impact of the small number of families with very high expenses (even though those families affect the mean premiums). For a better apples-to-apples comparison using Cass's data sources, we can look at the mean premium for individual coverage and compare it to the mean health care expenses of the under-65 population with private coverage. The former rose 204 percent from 1999 to 2017, or \$4,494, while the latter rose 161 percent, or \$2,627. See KFF (2019) and AHRQ (n.d.).

with children, Cass’s “young people forming families,” or a “middle-class family of four” (Cass 2020, 14–15). But it would still need to address quality changes and substitution.

Moreover, Cass offers no reason to think any of these alternative indexes would show inflation that is any different from the population as a whole. While it is hard to track down data for 1985, in the 2021 Consumer Expenditure Survey, we can see the breakdown by household composition (BLS 2021b). Married couples with young children (under age 6) had similar spending shares as “all consumer units”: 11.4 percent versus 12.4 percent on food at home, both 19.8 percent on shelter, 16.2 percent versus 16.4 percent on transportation, 7.0 percent versus 8.1 percent on health care, and 0.9 percent versus 1.8 percent on education. (The education category increases as the children age.)

Cass’s lament that inflation measures do not account for “regional and demographic differences” also neglects that research in these areas by experts is ongoing, in the development of geographically varying cost-of-living indexes and indexes reflecting the consumption of poor people and older people (Cass 2020, 6; BLS n.d.).

## Cass’s Flawed Critique of the Best Inflation Measure

In the earlier paper, Cass reviewed two inflation measures, casting doubt on the Personal Consumption Expenditures (PCE) price index that we use in our analyses. He begins by wrongly characterizing the Consumer Price Index for All Urban Consumers (CPI-U) as the federal government’s preferred inflation measure. It is more accurate to say that, historically, it has been the measure most often used for policy purposes. But federal agencies primarily doing empirical work—as opposed to political work—long ago indicated a preference for better measures.<sup>36</sup>

The major federal agencies examining income and wages began abandoning the CPI-U in the late 1980s because it suffered from significant flaws. By 1993, it had been downgraded in favor of the “CPI-U-X1” by the

Bureau of Labor Statistics (BLS), the Census Bureau, and the Congressional Budget Office (CBO). The CPI-U-X1 didn’t fix all the flaws in the CPI-U. By 1999, a new measure, the CPI-U-RS (now CPI-U-XRS) was introduced, and estimates were created back to 1978. This is the measure BLS and the Census Bureau tend to use today. Nevertheless, Cass focused on the CPI-U, which to this day retains for the estimates from December 1978 to December 1998 all the flaws the CPI-U-XRS corrected.

Cass did note that the Federal Reserve Board switched to the PCE price index in 2000. The CBO also switched to the PCE in 2012 for its income analyses. An unambiguously better feature of the PCE relative to the CPI-U is that it accounts for both “upper-level” and “lower-level” substitution bias (back to 1929). Upper-level substitution is when people switch from buying oranges to buying apples when their relative prices change. Lower-level substitution is when they switch from buying Red Delicious apples to McIntosh apples.

As discussed above, accounting for the ability of consumers to substitute is important because consumers have options when prices change. They don’t have to keep buying what they used to when some prices rise; they can rebalance and avoid the full utility loss they would endure absent this ability. The CPI-U accounts only for lower-level substitution—and only since 1999. Consequently, it shows higher inflation over time than the PCE, and when incomes are adjusted using it, the increase is smaller over time than when the PCE is used.<sup>37</sup>

Cass downplays this advantage of the PCE via a chart purporting to show that the upper-level substitution makes only a small difference when comparing PCE inflation to inflation using the CPI-U. But the chart shows that it accounts for over half the difference. Furthermore, all the evidence Cass cites in support of his claim comes from data going back only to 2002. That’s important because Cass is interested in affordability trends back to 1985. Whatever difference substitution makes from 2002 to today in how the CPI-U and PCE differ, it makes a bigger difference before 1999, when the CPI-U accounted for *no* substitution. Cass’s discussion minimizes this clear superiority of the PCE by not mentioning any of this.

<sup>36</sup> This section draws heavily from Appendix 2 in Winship (2016).

<sup>37</sup> Cass claims the CPI-U does not account for substitution at all, but that is not true. It does account for lower-level substitution over the years for which he compares the two indexes.

Instead, he highlights the different weights that housing and medical care receive in the CPI-U and PCE indexes. But this issue is a distraction. BLS has a more recent inflation measure called the chained CPI that accounts for both upper- and lower-level substitution and weights things similarly to the CPI-U. It shows similar inflation rates as the PCE—lower than the CPI-U, not higher, as Cass’s discussion would have it. (Cass mentions the chained CPI only in a footnote.) From 2002 to 2018 (the period over which Cass compares measures), the chained CPI and the PCE both increase by about 34 percent, the CPI-U by 39 percent. Unfortunately, the chained CPI goes back only to 2000, so it is impractical for many income studies. But since it shows similar inflation rates as the PCE, and because both fully account for substitution bias, the PCE should clearly be preferred to the CPI-U for long-run analyses.

## Problems with the Cass COTI

We have already discussed a variety of specific shortcomings in Cass’s COTI analyses that we remedied while producing Tables 1 and 2. But COTI can and should be rejected on more general theoretical and methodological grounds. Cass believes that his approach “removes the need to make assumptions about inflation over time” (Cass 2020, 15). But it involves a slew of arbitrary choices and requires its own assumptions.

**Cass looks mostly at trends in spending rather than trends in costs.** Spending on some category, such as food or cars, can increase over time because the same amounts and types of food or the same type of car becomes more expensive. This constitutes an increase in cost, or price.

However, spending can also increase even if prices fall. If people become richer over time, then they will tend to buy more food and nicer cars. Cass may think he eliminates this problem by defining supposedly fixed products. He arguably achieves this for his food basket, though that is because the US Department of Agriculture (USDA) relies on conventional inflation-adjustment methods to update the basket over time. But people might spend more on the average car; a 40th-percentile-of-rent three-bedroom apartment in Raleigh, North Carolina; typical employer health insurance coverage; or four

years of college at a public school because these specific things are all better than they used to be. That is not an increase in cost; it involves spending more than before to get something better than before.

If someone prefers to buy the same (worse) set of things as in the past, those may be cheaper than they used to be. A below-average car in 2022 may be better and cheaper than the average 1985 car. The 30th-percentile-of-rent three-bedroom apartment in Raleigh today might be nicer and cheaper than a 1985 40th-percentile apartment. And typical health insurance coverage today pays for better care and more kinds of care than it did in the past.

Spending on an item can also go up if the relative prices of other items go down. The slower growth in the price of clothing has freed up money that can be spent on health care, for instance. If people react by spending more on health care, that is not an increase in the cost of health care.

**Cass arbitrarily defines what “needs” are.** Needs included in COTI involve only five categories of spending and detailed specifications of products within these categories. Food, transportation, housing, health care, and higher education are deemed “needs,” while clothing, home furnishings, utilities, and communications technology are left out.

Within the five categories, needs are further arbitrarily defined. COTI incorporates food costs by using an average of the USDA’s “low-cost” and “moderate-cost” budget for June of each year. There is no particular reason Cass should not instead use the lower-cost “thrifty” plan to define “needs” (nor for that matter the higher-cost “liberal” plan). Cass’s food budgets are for a family with a married couple, both age 20–50; one child age 6–8; and one child age 9–11. According to the Annual Social and Economic Supplement to the Current Population Survey, in 1985 and 2022, that specific configuration covered only one in 20 families with children. Among families with children in 1985, only 26 percent had two parents age 20–50 and two children of any age; in 2022, just 21 percent did. Surely, determining what a “need” is requires determining what types of household configurations people want. If, over time, fewer people want to marry or stay married or have children, that would lower food needs. The same is true if people want to have fewer children over time.

Transportation costs involve estimates from the American Automobile Association, based on a subset of car makes and models the company chooses. “Needs” are defined in terms of what is typically spent to own and operate the cars chosen in each year, rather than, say, cars with a constant set of features. The purchase price of new cars is spread out over years in which the car depreciates. The depreciation estimates assume that a car is driven for a certain number of miles over a certain period. Insurance costs are “based on a full coverage policy for personal use of a vehicle by a driver who is under 65 years of age, has more than 6 years of driving experience, no accidents & lives in the suburbs or city” (AAA 2022a). They assume a specific level of coverage.

The need for a car also varies depending on one’s situation. Those in more urban environments have less of a need, given the existence of public transportation. People in 2022 had less of a need for a car given the existence of ride-sharing services, short-term car rentals, and drop-on and drop-off bicycles and scooters. Some families may need two cars, even if they have only one earner.

COTI ignores the market for used cars. It also ignores other modes of transportation such as air and train travel.

For housing, Cass uses the amount paid by renters to establish housing “needs,” even though a majority of families own their home. Cass looks at rent for a three-bedroom apartment rather than one with, say, two bedrooms. He focuses on rents in a single city, Raleigh, and focuses on the 40th percentile of rents there (rather than more or less pricey percentiles).

There is no reason to think that this specific configuration of choices does an equally good job representing housing “need” in both 1985 and 2022 (even for renters in Raleigh). COTI does not consider whether smaller families means there is less of a need over time for three bedrooms. It is possible that Raleigh was less representative of the typical American’s housing costs in 1985 than it was in 2022. The “need” standard does not attempt to hold constant the quality and size of housing over time.

Health “needs” are confined to employer-sponsored health insurance rather than including out-of-pocket spending. The data source excludes federal employees. Coverage is for a family of four, which again raises the issue of how to define needs when family size is

declining. Cass’s cost is an average across firms of the cost of firms’ most popular health plans. This average may conceal workers’ ability to afford lower-cost plans that are available to them, and “needs” are not consistently defined over time with respect to a baseline fixed level of coverage.

For education costs, Cass arbitrarily uses the sticker price from four-year public institutions as the benchmark for education “needs,” even though fewer than 30 percent of high school graduates immediately go into public four-year colleges (and fewer than 25 percent did in 1985).<sup>38</sup>

**Cass ignores that families can economize depending on their circumstances.**

When some prices rise, people can change what they buy to mitigate the harm done. The ability to economize means it isn’t the case that the typical family spends the typical amount on every individual item in a consumption basket, contrary to what COTI assumes. Families may spend more than is typical on health insurance and less than is typical on housing, for instance—especially if they have high health needs or live in a low-housing-cost area. Or they may spend more on housing and less on higher education if a child does not go to college, attends a two-year college, or simply goes to a four-year college with below-average costs. (Cass arbitrarily allocates college expenses across 16 years of parents’ lives, but if they save that way, the rest of their lives involve no higher education expenses at all.)

Families’ ability to economize also means they can spend more on the items in Cass’s basket over time and less on the items that aren’t in his basket—especially if the items that aren’t in his basket get cheaper over time or see price increases smaller than the rise in earnings.

**Cass compares average costs for health insurance and higher education (and, to some extent, transportation) to median earnings.**

A more valid analysis would compare averages or medians for both costs and earnings, since averages are pulled upward by outliers. The number of weeks it takes the median worker to afford average health insurance or higher education costs is greater than the number required by the average worker, and the increase over time is likely greater for the median worker.

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38 These calculations use the percentage of recent high school graduates who enroll in a four-year college and multiply by the share of fall enrollees in four-year colleges who go to public institutions. See NCES (2022) and NCES (2021a).

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